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ARCHIVES OF OTOLARYNGOLOGY

VOLUME 6 NOVEMBER, 1927 NUMBER 5

THE MODUS OPERANDI OF VERTIGO*

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NEW YORK

Vertigo is a feeling of confusion, a lack of knowledge of one's position in space, usually accompanied by a sensation of movement of self in some direction, or of a movement of one's surroundings, with the result that an attempt is made to correct the position by a movement in the opposite direction, or to assume some safe pose, such as lying or sitting down.

The anatomic arrangement of the internal ear and its connections with the cerebrospinal fluid, with its continuous series of pressure changes, offer a logical explanation for the production of the tonic impulses from the labyrinth, which produce muscular tonus and equilibration of the muscles.

Knowledge of one's position and changing position, one's orientation in space, is derived from the eyes, the internal ear (the labyrinth), the tactile, muscular and arthrodial senses and possibly from the tactile nerves of the large organs of the body.

Destruction of a sufficient number of these informing impulses prevents the sensorium from having an adequate knowledge of orientation, and confusion and vertigo may result. The most important of all these impulses are those from the labyrinth, which is the main end-organ for the appreciation of turning of the head. Sensations of turning can be most easily induced by influencing this organ, e. g., by rotation of the head, caloric methods, application of the galvanic current, pressure or suction on the labyrinth, etc. Slight changes of the labyrinthine impulses of one side are apt to produce vertigoes.

Abnormal one sided conditions in the labyrinth, the vestibular nerves, the vestibular nerve centers in the bulb, the paracerebellar nuclei, the cerebellar nuclei and cortex and the connections to the red nuclei, optic thalmus, cerebral cortex, etc., may upset the balance in the sensorium sufficiently to induce vertigo.

The afferent impulses from the vestibular nerve endings in the labyrinth are continuous. They keep one informed concerning the position and changing position of the head. Sufficient stimulation of one

* Read before the Section on Laryngology, Otology and Rhinology at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 18, 1927.

labyrinth more than of the other produces a sense of rotation, and, consequently, vertigo results.

Likewise, interference with the normal afferent impulses of one labyrinth produces a comparative increase of impulses from the other labyrinth. Anything increasing or decreasing the transmission of these impulses of one side produces disequilibration and the tendency for the striated muscles to make vestibular nerve reaction movements. There is a threshold point of changes in these impulses in the normal person, beyond which somatic reactions and vertigo result.

Philogenetically, the neurons of the eighth nerve were the last to develop; they reached their highest development in man and so are the most vulnerable to toxins. When the blood contains toxins, organic or inorganic, or too much or too little of the normal constituents, the neurons of the vestibular system become hypoirritable or hyperirritable, and the threshold for vestibular somatic reactions retreats or advances. These changes can be brought about in the transmission of these normal impulses on one side, by local blanching or plethora of the circulation of the blood, or by inflammation or destruction of any part or parts of the chains of neurons involved. The nuclei, dendrites and labyrinthine hair cells are more vulnerable than the axis cylinders, both to pressure and toxins. The changes in the irritability of the vestibular neurons may well be variable; the change in irritability may be more on one side than on the other and may be irregularly placed among the neurons. When this threshold of irritability advances more on one side than on the other, much slighter changes of the impulses of that side will produce vertigo, while the decreasing irritability of one side will relatively increase the irritability of the other side.

The part of the labyrinth concerned with orientation and vertigo is called the static labyrinth. It contains the vestibular nerve terminations at the ampullar (enlarged) ends of the membranous semicircular canals and in the saccules and utricles in the vestibules of the internal ear.

The membranous static labyrinth consists of the semicircular canals, three in each labyrinth, the utricles, the saccules (one in each vestibule), connecting small tubules and a tube (the ductus endolymphaticus) leading to a sac situated in the posterior cranial cavity on the posterior wall of the petrous pyramid between two layers of dura.

The cerebrospinal fluid in the cranium is constantly changing in pressure. The pressure rises with every systole of the heart, with every expiratory phase of respiration, with the changing arterial tension, (Traube-Hering waves,) with pressure on the vessels of the neck, with changes of position of the body, with sufficient striated muscular efforts and with mental conditions of anger, excitement, etc. In other words, pressure waves are occurring in the cranium at least ninety times a minute.

The membranous labyrinth is a closed series of cavities containing endolymph. In the labyrinth it is largely surrounded by perilymph; in the posterior cranial fossa, it is subject to the pressure changes in the cerebrospinal fluid.

As stated in the foregoing, the two endolymphatic sacs are situated in the posterior cranial cavity near both labyrinths and communicate directly with the parts of the membranous labyrinths that contain the nerve terminations of the vestibular nerves.

In other words, the waves of pressure of the cerebrospinal fluid are transmitted directly from the endolymphatic sacs to the terminations of the vestibular nerve. These waves stimulate the vestibular nerve endings and produce a continuous succession of afferent impulses to the brain. Small variations or changes in these pressure waves in the labyrinth can cause vertigo. In increased intracranial pressure these endolymphatic pressure waves are greater, so that slighter variations between the two sides produce vertigo.

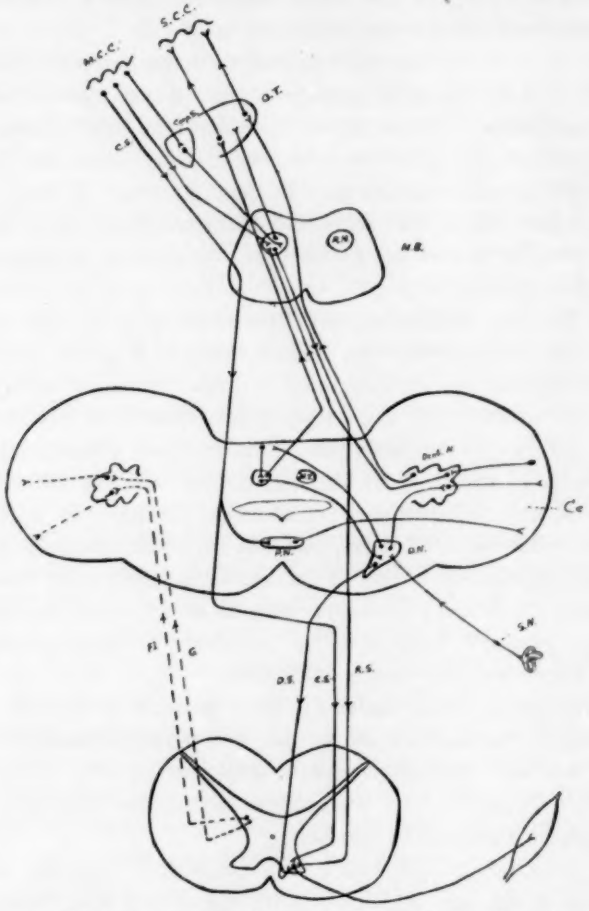
In bending the head forward, downward and to one side, as in putting on one's shoes, the cerebellum, being of higher specific gravity than the cerebrospinal fluid, comes in closer contact with the endolymphatic sac of that side and more or less blocks off, momentarily, its duct to the interior of the labyrinth. This produces a relatively increased flow of waves in the duct of the other side. If one adds to this the increased intracranial pressure caused by flexing the neck strongly against the collar or neck-band, one has an ideal condition to produce vertigo in abnormal conditions of the vestibular system of neurons.

Increased intracranial pressure with its concomitant increased intralabyrinthine pressure may also be a cause of hyperesthesia of the vestibular nerve endings in the labyrinth.

There are great variations in different persons in the size and shape of the recess on the surface of the petrous pyramid in which the endolymphatic sacs lie. This may explain why vertigo is so common in certain persons, being due to the greater tendency for these endolymphatic pressure waves to be blocked.

In labyrinthine disease, there is a marked change in the afferent nerve waves from one labyrinth, with the result that violent vertigo occurs, until the sensorium adapts itself to the new relative impulses from the two sides. The stage of stimulation, shown by nystagmus toward the affected labyrinth, is probably due to toxic irritation or irritation caused by pressure of the vestibular nerve endings on that side. The stage of paralysis, shown by nystagmus toward the other labyrinth, may be due either to loss of function of the vestibular nerve terminations of that side or to suppression of the normal intramembranous labyrinthine waves, or both.

Tympanic abnormalities that change from time to time may cause vertigo. This is brought about by changes in the intralabyrinthine circulation of the blood due to irritation of the sympathetic nerves in the tympanum and membrana tympani of one side. In the same way, a strongly irritating liquid in the middle ear may cause nystagmus and vertigo. This sudden change in the arterial supply of one labyrinth



The more important nerve tracts concerned with vertigo (modified after Friesner). *S.N.* indicates Scarpa's nucleus; *D.N.*, vestibular nuclei; *Dent.N.*, dentate nucleus; *Ce.*, cerebellum; *M.B.*, midbrain; *R.N.*, red nucleus; *O.T.*, optic thalamus; *S.C.C.*, sensory cerebral cortex; *Corp.S.*, corpus striatum; *M.C.C.*, motor cerebral cortex; *C.S.*, corticospinal tract; *N.T.*, nucleus tecti (fastigii); *P.N.*, pontile nuclei; *R.S.*, rubrospinal tract; *D.S.*, Deitersospinal tract; *Fl.*, Flechsig's tract; *G.*, Gower's tract.

alters the endolymph currents in the membranous labyrinth sufficiently to upset the equilibrium between the two induced afferent nerve impulses from the labyrinths, with the result that vertigo may ensue.

Conditions in the nose and throat that affect the sphenopalatine ganglion (which has nerve connections to the tympanic plexus) may also produce vertigo by affecting the labyrinthine circulation. If these changes should occur in a neuresthenic person or in a person having hyperesthesia of the vestibular nerve endings, a smaller than normal threshold stimulation would bring about vertigo.

In many cases of tubotympanic otitides, toxins are present in the blood which might easily cause hyperesthesia of some part of the vestibular neurons and so make the onset of vertigo probable.

THE ELEMENTS OF VERTIGO

Vertigo is a complex made up of at least three elements: (1) The vestibular nerve reaction movement reflex; (2) the sensation of turning, and (3) the resulting opinion of the sensation followed by psychic and somatic reactions.

1. *The Vestibular Nerve Reaction Movement Reflex.*—The vestibular nerve reaction movement reflex passes from the labyrinth to the vestibular nerve centers (Deiters' nucleus, ventrocaudal nucleus of Deiters, nucleus triangularis, Bechterew's nucleus, nucleus embologlobosis, then to the dentate nucleus, the cerebellar cortex, back to the dentate nucleus, then to the red nucleus and last, by the rubrospinal tract to the motor cells in the anterior horn of the cord and to the muscles. This reflex contains at least seven neurons. Involvement of any one of them may produce vertigo.

Other neurons also enter into the reaction reflex: the corticospinal from the motor cerebral cortex to the motor cells in the anterior horns of the cord and thence to the muscles; the deitersospinal from the vestibular nuclei to the anterior horn cells and muscles; the corticopontile tract to the cerebellar cortex; the tracts from the vestibular nuclei to the cortex of the worm; then to the nuclei tecti (fastigii) and back to the vestibular nuclei and undoubtedly many others not yet traced.

2. *The Sensation of Turning.*—The sensation of turning is brought about by the passage of these vestibular impulses of changed relative intensity from the two sides, to the centers situated in the parietal cortex, subcortex, or the optic thalamus. Physiologists are still in doubt as to the exact locality.

There may be a slight feeling of turning in the cerebellum and the brain stem, but it is, in the main, probably subconscious and does not become well defined until reaching the higher centers. On the other hand, the sensation may be a resultant from all these sources. At any rate it is beyond the arcs of vestibular somatic muscular reaction.

The muscular reaction movements of the eyes, limbs and body are also followed by sensory impulses to the sensorium, which contribute to form the vertigo complex.

It would seem probable that the nearer the labyrinth the alteration of the afferent impulses from the labyrinth occurred, the clearer the sensation would approach that of real turning and the greater the vertigo.

3. *The Resultant Opinion of the Sensation Followed by Psychic and Somatic Reactions.*—Every projection center is connected with every other one by associatory neurons and is also thus connected with the associatory areas, in which the different concepts are supposed to arise, together with the motivating feeling to act.

The sensation of turning, clearly felt in the parietal cortex, is further analyzed in the association areas; it is compared in quality and intensity with past experiences together with their sequelae, and a real concept is developed. This results in anxiety or fear and produces all the concomitant somatic reactions depending on the temperament and physical constitution of the subject.

This may bring about changes in the circulation of the blood, feelings of flushing of the face, faintness, syncope, etc.; respiratory changes; gastro-intestinal reactions such as nausea, vomiting and diarrhea; changes in the kidneys, such as increased micturition and production of urine.

Otitic vertigoes and those caused by diseases of the vestibular nerve tracts up to the parietal cerebral cortex involve all three of the foregoing components of the complex called vertigo; hence the result, marked sensation of turning, etc.

When the two other components outside of the ear and the vestibular tracts only are affected, such as the multitude of associatory fibers, not only in the cerebral cortex but also in the rest of the brain, then the sensation of vertigo is much more confused and may amount merely to a feeling of uncertainty. This is true of ocular and psychic vertigoes.

Of course, vertigo may be of a turning type, when the nerve currents are sufficiently strong to spill over from neighboring neurons, such as the oculomotor to the vestibular neurons, but I believe this is rare.

CONCLUSIONS

1. The basic part of true vertigo occurs in the series of vestibular neurons connected with the production of reaction movements of the muscles.

2. The afferent impulses initiating these movements start in the labyrinth, mainly from the semicircular canals.

3. These afferent impulses are caused by the continuous series of intracranial pressure waves transmitted directly to the vestibular nerve endings in the labyrinth through the ductus endolymphaticus.

4. Sufficient alteration of the impulses from one side produces a tendency to reaction movements of the muscles and vertigo. This alteration may occur in the generation of impulses in one labyrinth as compared to that in the other or in a change in the transmission of the impulses through the vestibular chain of neurons of one side to the brain centers.

DISCUSSION

DR. JOHN HUNTER: I should like to ask Dr. Hubby what effect fatigue has in vertigo. In my own case, when I have a good night's sleep, there is complete relief, but when I have a busy day in my office, I find that the vertigo increases with the psychic work, so that toward the afternoon I often find some difficulty in moving around the office. I neither smoke nor drink, so that the condition cannot be attributed to either of these causes. I feel that it is due largely to fatigue of the vestibular nerve endings, or something of that kind, and I will give you my reason for thinking so. I am a physiotherapist, using the high frequency machine. When I find myself getting troubled with vertigo I place a small electrode on each ear and by means of diathermy try to flood the labyrinth with a fresh supply of blood. Within a few minutes, I can go on with my work comfortably. I think it is the fresh supply of blood that restores the vestibular nerves to functional activity. The question came to my mind as to whether the trouble was due to hypertension or hypotension. I have had my blood pressure taken and have been told that it is not abnormal for my age—77—but when I go home, I am going to have a careful examination made of the blood pressure to see what effect hypertension or hypotension may have on my vertigo. Up to the present time, I feel that it is largely due to fatigue affecting the auditory system, because sleep or a little hyperemia of the labyrinth restores normal physical ability. The vertigo disappears, and I can go on with my work. I also notice that when I have the most difficult cases to deal with the vertigo begins to bother me more quickly; so I should like to ask Dr. Hubby just what effect fatigue has in producing vertigo?

DR. I. LEON MEYERS, Los Angeles: I was interested in hearing the speaker explain the origin of the vestibular impulses in the pressure of the cerebrospinal fluid. All of you are probably familiar with Goltz's theory, in which he attributed it to the hydrostatic pressure of the fluid within the canals. I have evidence in favor of what the speaker has said, that the cerebrospinal fluid produces impulses on the vestibular nerve endings, in the fact that in some cases of vertigo, a lumbar puncture, as originally proposed by Babinski, reduces the vertigo. You are all familiar with the well-known Barany's symptom-complex, which is due to an accumulation of fluid within the angle. This is also relieved by lumbar puncture. In connection with the seat of origin of vertigo, it appears to me that there is a good deal of evidence against the assumption that the cerebellum is a lower center, that is, an unconscious center. There is good reason to believe that vertigo originates within the cerebellum.

I recently had a patient, a woman, who had a bilateral mastoid disease several years ago, and a few weeks before entering the hospital began to suffer from symptoms of intracranial pressure, headache, vomiting; she had a beginning choked disk. She did not have any nystagmus. She did have a past-pointing and a falling reaction. It is generally thought that the past-pointing and falling reaction and the slow component of nystagmus are all manifestations of the same thing. While this patient did not have nystagmus in any direction, she did have past-pointing to the right and falling to the right; the past-pointing existed

to the extent of about 10 to 14 inches to the right. When the caloric test of Barany was tried, she did not show any constitutional effects. What I mean to show is that, in the absence of vestibular nystagmus, the patient had as a result of a cerebellar lesion, the past-pointing and falling to the right, manifestations of vertigo.

The patient was operated on by Dr. Isaac Johns and it was found that she had an accumulation of fluid in the cerebellopontile angle on the right side.

DR. HUBBY: Dr. Hunter spoke of fatigue as a cause of vertigo which was relieved by high frequency currents applied to the ear. There must be some abnormal underlying condition in the ear, the nose or the vestibular chain of neurons which sympathetically affects the circulation of the blood in the internal ear, so that when the latter is changed, attending fatigue, it is sufficient to produce vertigo. When the circulation of the internal ear is improved by electrical or other means, the vertigo is relieved.

620 Park Avenue.

EPIGLOTTIDEAN TUBERCULOSIS

DIAGNOSIS AND TREATMENT *

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Usually, the tuberculous invasion of the epiglottis is only a small part of the picture when the entire larynx is tuberculous. It is usually the most painful and the most rapidly fatal localization in the larynx, especially when all of the epiglottis is involved. On the other hand, the rest of the larynx sometimes shows so little involvement and the epiglottis so much relatively that tuberculosis of the epiglottis is the chief problem confronting the laryngologist. The importance of this situation is accentuated when the physician who is an expert in diseases of the chest reports that the pulmonary disease is limited to the left upper lobe and the right apex, with an excellent prospect for an early arrest of the pulmonary disease and later an ultimate cure, if the condition in the larynx can be cured; the pulmonary disease anyway offers a good chance for an ultimate cure.

Tuberculosis of the epiglottis too often has been considered a late symptom, when it may be an early manifestation, so far as the larynx is concerned. Therefore, if the epiglottidean tuberculosis can be arrested or cured, the patient's life can sometimes be saved. Invasion of the epiglottis as a late symptom of laryngopulmonary tuberculosis is of necessity not the subject under discussion in this paper. That epiglottidean tuberculosis is secondary to pulmonary tuberculosis needs only passing mention with the present everyday knowledge of tuberculosis.

The subjective symptoms may, and often do, remain latent for a long time before active manifestations are evident. Early and repeated laryngeal examinations may show infiltration of the laryngeal surface of the epiglottis just above the anterior commissure long before the subjective symptoms appear. This part of the larynx is easily overlooked by either direct or indirect laryngoscopy. However, it is easier now to make a thorough examination of the larynx than it was years ago, and the laryngologist should therefore make an earlier diagnosis. Besold and Gidionsen, according to Lockard,[1] assert that "The laryngeal surface is the more infiltrated in every case." Tuberculous infiltrations at this point are more likely to spread to the rest of the epiglottis and even to the base of the tongue than those involving the posterior laryngeal

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* Read at a meeting of the American Laryngological Association, Atlantic City, N. J., May 23, 24 and 25, 1927.

1. Lockard, L. B.: Epiglottidectomy. The Rational Treatment of Epiglottidean Tuberculosis, Tr. Am. Laryngol. A. 1911, p. 29.

wall. Lockard [1] says, "On the inferior portion of the laryngeal surface the mucous membrane contains so many lymphoid cells that it assumes the character of diffuse adenoid tissue, and in spots they are so grouped as to form distinct nodules. It is at these points the earliest epiglottidean foci would be expected to occur, a supposition supported by clinical and pathological observations. In only very exceptional instances, however, are specimens obtained at a stage of the infection sufficiently incipient to positively demonstrate this point." They may also spread to the aryepiglottic folds. However, they do not always spread rapidly.

The cartillages of the larynx, such as the thyroid and the epiglottis, offer a barrier to the extension of tuberculosis from the mucosa and the submucosa, just as they tend to limit the spread of early intrinsic carcinoma. They limit chiefly by continuity of tissue rather than by extension through lymph and blood streams.

During this early stage, slight hoarseness or even slight dysphagia may be present. On the other hand, it is surprising how much involvement may sometimes be present with almost no subjective symptoms. Other things being equal, tuberculosis of the epiglottis is more productive of pain, and especially of painful swallowing, than tuberculosis elsewhere in the larynx. Severe pain is nearly always a late symptom. Aphonia is less probable in epiglottidean tuberculosis, because the vocal cords are not involved until late in the disease, as a rule.

During the stage of infiltration of the laryngeal surface, the diagnosis is not always easy, because of the slight or moderate change from the normal. However, it is in this early stage that treatment can accomplish a great deal. The disease may, and often does, apparently remain stationary and confined to the inferior and posterior surfaces of the epiglottis for a period of months. If one compares this early stage with a later one in which the infiltration has extended to the lingual surface and to the base of the tongue, the picture is usually entirely different, because it is likely to be followed in a short time by ulceration. If ulceration takes place, it will probably be rapid in the epiglottis, and is usually painful. Edema or pseudo-edema, perichondritis, chondritis and necrosis follow rapidly in succession. These frequently produce severe symptoms in the late stages of the disease and are rarely amenable to treatment of any kind.

The prognosis is favorable if an early diagnosis has been made. During the late stage the prognosis is unfavorable because of the severe pain, rapid emaciation and fatal termination.

Rest of the voice in the early stage of infiltration, combined with proper care of the pulmonary disease, may arrest or even cure the tuberculosis in the epiglottis. Whispering may be sufficient for one patient, while silence will be required for another, but rest must be secured. Care of the patients in a sanatorium or hospital offers a far better

opportunity for rest of the voice and rest of the entire body than life at home. Well people need rest when they are tired, but tuberculous patients must rest so that they may not become tired.

Heliotherapy is one of the best methods that physicians have at their disposal for the treatment of tuberculosis of the epiglottis, but it should be used early. It is easy to use and is painless. Local applications rarely accomplish as much.

In 1904, Sorgo [2] first used mirrors to reflect the sun's rays into the larynx. He used glass mirrors. These absorb many of the chemical or actinic rays and reflect the heat rays. Sorgo's work was continued by Kunwald,[3] who reported his results with the treatment of fourteen patients. His results were encouraging and led to the use of heliotherapy in other sanatoriums in Switzerland, as well as in France, Germany and, later, in the United States. Janssen [4] and Kraus,[5] in 1909, improved on Sorgo's technic by attaching a mirror to a stand. Janssen [4] also suggested a concave mirror, but this reflects more heat than the plane mirror, so it is not always practical. The heat rays increase the hyperemia of the larynx and thus prevent the absorption of the chemical or actinic rays, which are so essential. Sorgo [2] tried the use of a water filter to eliminate the heat rays, and he also sprayed the larynx with epinephrine in an effort to avoid hyperemia. During more recent years, a metallic alloy of aluminum and magnesium has been found more satisfactory for making the mirrors, because it absorbs the heat rays and reflects the maximum of the ultraviolet rays. The latter are the beneficial chemical or actinic rays which tan the skin and which have been found so beneficial in all forms of heliotherapy on account of their bactericidal action.

Forster and Chapman [6] recommend, to begin with, short exposures of thirty seconds daily. The length of each treatment can be gradually increased each week until the larynx is exposed to the sun's rays for ten minutes daily or even twice daily. Occasional patients seem to do well with exposures of twenty minutes.

A patient generally becomes greatly interested in this form or method of treatment, because he can examine his own larynx. There-

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2. Sorgo, J.: On the Treatment of Laryngeal Tuberculosis with Reflected Sunlight, Wien klin. Wchnschr. **17**:12, 1904.

3. Kunwald, L.: On the Treatment of Laryngeal Tuberculosis with Sunlight, Munchen. med. Wchnschr. **52**:59, 1905.

4. Janssen, T.: On the Therapy of Laryngeal Tuberculosis with Especial Reference to Sunlight Therapy; a New Practical Sunmirror, Deutsche med. Wchnschr. **35**:835, 1909.

5. Kraus, H.: On the Technic of Sunlight Treatment of Laryngeal Tuberculosis, Munchen. med. Wchnschr. **56**:658, 1909.

6. Forster, A. M., and Chapman, S. J.: Heliotherapy in the Treatment of Tuberculous Laryngitis, Colorado Med. **22**:90, 1925.

fore, this serves as an occupational therapy as well. Occasional patients become overenthusiastic and are apt to expose the larynx to the sun's rays too long at a time and too often. This produces hyperemia, congestion or even the formation of small vesicles which rupture later.

Advanced laryngeal tuberculosis is not likely to be benefited by heliotherapy or by any other form or method of treatment, but early or moderately advanced forms are often cured, or at least arrested. Pain is lessened, infiltrations tend to disappear and superficial ulcers heal. Relief of pain is by no means one of the least important of the advantages of heliotherapy.

In the later stages amputation is today, as it has been for years, the best treatment either with or without cauterization of the epiglottic stump. I believe that cauterization helps greatly if the condition of the patient is such that this can be employed following amputation. The use of the cautery without amputation has not given satisfactory results in my hands. The epiglottis may be amputated by the direct or by the indirect method. Tuberculous patients are only rarely good risks for general anesthesia, so the epiglottis should be removed under local anesthesia. For amputation I prefer the indirect epiglottis punch forceps, of which there are several models. This leaves the patient freer to raise sputum than when he is suspended. The base of the epiglottis can then be cauterized by the indirect method. The cautery lessens the hemorrhage and pain. It shortens the period of recovery and tends to prevent infection. Cicatrization of the epiglottic stump is the desired ultimate result, and the cautery aids greatly in accomplishing this. The fibrosis of the base cures the tuberculosis. This method of treatment does not interfere with swallowing. In fact, swallowing becomes much easier, because the pain is often entirely relieved.

REPORT OF CASE

The following case report will show the advantages of rest in bed, fresh air, sunshine, good food, rest of the voice and heliotherapy by means of the solar laryngoscope:

History.—Mrs. A., a teacher, aged 29, consulted Dr. O. M. Gilbert, Sept. 12, 1922, complaining of cough, expectoration, fever, hoarseness, night sweats and hemoptysis. Later, she developed aphonia. The family history was unimportant. She had pertussis and measles in a severe form, but without any sequelae. She had pneumonia in infancy, but she recovered fully. Puberty occurred at 15. She was married in April, 1919. She was perfectly well until February, 1919, when she had pleurisy on the right side. She was sick only a week and thinks she did not cough. She was well again until some time in February, 1920. She again had pleurisy without sequelae. Then she was well again until she had influenza in February, 1922, followed by cough and spitting of blood, with much pain in the region of the right maxillary sinus. She was out of school two weeks and felt miserable. Her weight dropped down to 104½ pounds (47.4 Kg.), and she

had a cough with expectoration. The cough and expectoration had never entirely stopped. She came to Boulder for absolute rest. Her temperature soon came down to 99, and she was better during the fall and winter of 1922-1923, although at two times she lost her voice for a month. Each time all the symptoms improved until July, 1923, when she had a "cold" and her temperature rose to 99 or 100 for from one and one-half to two weeks. Her cough and expectoration were freer, and she lost her voice. She thought that she had not returned to her previous condition, especially so far as improvement of cough, expectoration and hoarseness were concerned, but her temperature was normal. She had some pain in the stomach, mostly after eating. Her weight increased to 146 pounds (66.2 Kg.) early in the summer of 1923. The temperature was rarely as high as 99.

Examination.—The patient was well developed and nourished. She was slightly obese and her color was good. The knee reflexes and pupils were normal. The tonsils were slightly infected. Adenopathy was present, especially on the left. Abdominal examination showed slight tenderness over the gallbladder and the appendix. The heart was normal. Litten's sign could not be seen on account of fat. Mobility of the lungs was poor on the right, but fair on the left.

Right Lung: Moderate dulness was present to the second rib and sixth dorsal space. There was a suggestion of amphoric breathing at the spine of the scapula, with bronchial breathing, increased fremitus and whispered sounds. A moderate number of râles was present to the fourth and fifth dorsal space. Few crackles could be heard at the base.

Left Lung: Moderate dulness was present to fourth rib and the sixth dorsal space, with less changes in the breath and voice, but a number of moderately coarse râles over the same region.

Examination of the blood showed: hemoglobin, 85 per cent; white blood cells, 9,400; lymphocytes, 35; large mononuclears, 5. The pulse was 62.

The urine was acid and showed a specific gravity of 1.012. Albumin, indican and sugar were absent. The diagnosis was far advanced, bilateral pulmonary tuberculosis.

Treatment.—Mrs. A. was referred by Dr. Gilbert for an examination of the nose and throat in December, 1923. This examination was practically negative except for the discovery of a slight infiltration of the interarytenoid sulcus and of the posterior and inferior surface of the epiglottis. One arytenoid was also infiltrated. Pseudo-edema, ulcers, etc., were absent and did not develop at any subsequent time.

She was placed on absolute silence, rest in bed in the open air, nutritious diet, and the use of solar laryngoscope, beginning with an exposure of one-half minute once daily and gradually increasing the length of each treatment until she was receiving ten minute doses once or even twice daily. Her temperature would reach 99.6 occasionally during the first few months; then it gradually settled down to normal, and the pulse to 80 or 90. Her weight continued about the same. This treatment was faithfully carried out for one year, when she showed so much laryngeal improvement and as her general condition had also improved that she was allowed to whisper. She was put on graduated exercise, and in five months she was walking thirty blocks a day and was doing a little light housekeeping. She was also taking sodium cacodylate, 4 grains (0.26 Gm.), every four or five days. She used the solar laryngoscope every other day the second year and has discontinued its use since. After two years, it is impossible to tell that she has ever had laryngeal tuberculosis. Her cough and expectoration are gone. Now she uses her voice as much as she likes, but she rests several hours every day. She does only light housekeeping and continues to live in Colorado.

CONCLUSIONS

The four most important methods of treating epiglottidean tuberculosis are as follows: First, rest of the voice either by absolute silence or whispering; second, heliotherapy; third, the cautery, and fourth, amputation. The patient described has been cured by the first and second methods, because the cautery has not been used at any time and, of course, amputation has not been considered. The early diagnosis of the epiglottic lesion permitted early treatment and a result that could not possibly have been obtained with a late diagnosis.

Physicians' Building.

DISCUSSION

DR. B. R. SHURLY, Detroit: This subject has been of great interest to me, and the trend of the times is certainly to take these cases out of the field of the laryngologist and into the care and direction of the sanatorium worker. They are essentially sanatorium cases. Invariably they involve some pulmonary lesion and the question of the therapeutic result in the laryngeal treatment is, in large measure, in close relationship to the progress of the pulmonary lesion and the involvement or the extent of the involvement, and the question of whether one has to deal with a case that can be treated with artificial pneumothorax.

It is my observation that this work has almost been standardized in the last few years and that out of the great and enormous number of therapeutic measures that have been advocated many years in the past, there are only a few that stand out and show the actual value of the results. It is undoubtedly true that about 15 per cent of the patients with laryngeal involvement are in the sanatoriums. In more than fifteen years' service in my own city, the number has varied between 13 and 17 per cent during that time. Of this number, comparatively few will show these early manifestations in the epiglottis, and one has, therefore, to deal with them by the best methods available such as the use of formaldehyde in increasing strength, and the solar laryngoscope. Of course, in the southwestern parts of this country, in Arizona and New Mexico, where sunshine is so plentiful, the patients can enjoy climatic treatment, at the same time as the solar laryngoscopic treatment, and they show a decidedly greater increase in the number of cures, than those in the northern climate. The reports of one institution down in New Mexico show remarkable results in 50 per cent of all the laryngeal cases under treatment with this solar method which Dr. Spencer has presented.

When the ulceration was progressive in the epiglottis, I have often performed the operation of amputation of the epiglottis, and while it is discouraging as to final result, because most of the cases are quite far advanced when this operation is necessary, there is certainly a great relief to the pain in swallowing and that helps in the important question of the nutrition of the patient, as to whether one is going to get some good result in the pulmonary region, and there the operation is useful in a certain number of carefully selected cases. I am sure that not over 1 per cent of the laryngeal cases have involvement of the epiglottis.

Dr. Joseph B. Greene, Asheville, N. C.: Just as in malignant tumors of the face, so one should emphasize early diagnosis of epiglottidean tuberculosis.

As to treatment, it has been my experience to depend on cautery. In my hands, that is the most efficacious method. Certain cases do not respond; the pain continues in spite of the cautery. In those cases, removal of the infiltrated parts promises the only source of relief. I agree with Dr. Spencer in what he says: When the epiglottis is removed, the base must be cauterized, for obvious reasons.

I am inclined to use heliotherapy as a third resort, instead of placing it first. I would place the cautery first; removal of the infected part second, and the heliotherapy third; and I would emphasize rest in a sanatorium.

Dr. F. L. Dennis, Colorado Springs, Colo.: I want to second what Dr. Spencer has said with reference to the value of heliotherapy directly applied to the larynx in tuberculosis. I think one must remember these things about tuberculosis of the larynx — which is analagous to what somebody said about cancer. Not all patients with tuberculosis affecting the epiglottis have great pain. Some are remarkably free from pain. More than once, I have been surprised to see extensive infiltration of the epiglottis without much or any complaint on the part of the patient.

Dr. W. B. Chamberlain, Cleveland: I would like to ask the opinion of the society in regard to the incidence of tuberculosis of the larynx, not so much in the West where many of the patients go, but in the East. In my experience of over twenty-five years, it has seemed to me that the incidence of the cases has changed decidedly. In the old days, there was hardly a time when I did not have some of these cases under treatment. I was discussing this subject with Dr. Shurly last night. At present, a patient coming into the clinic with tuberculosis of the larynx, is a rare occurrence.

Dr. F. R. Spencer, Boulder, Colo.: I would like to emphasize the importance of artificial pneumothorax that Dr. Shurly spoke of.

Dr. Dennis emphasized the importance of heliotherapy in selected cases. In patients who have high fever and a lot of involvement heliotherapy is not suitable treatment.

Dr. Chamberlin speaks of incidence: I believe everywhere one sees fewer cases.

ACUTE OTITIC TEMPOROSPHENOIDAL ABSCESS

SEPTICEMIA, GRADENIGO'S SYNDROME, ACUTE SURGICAL MASTOIDITIS, ACUTE SUPPURATIVE OTITIS MEDIA, FRONTO-ETHMOIDAL EMPYEMA, GRIP: REPORT OF A CASE WITH POSTMORTEM OBSERVATIONS

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A case of acute otitic temporosphenoidal abscess is reported because of the rarity of the condition. It is said that only six cases of Gradenigo's syndrome associated with temporal abscess are to be found in the literature.[1]

REPORT OF CASE

History.—F. D., a boy, aged 16½, a student, was first seen on Feb. 14, 1925, giving a history of grip with symptoms referable to the upper respiratory tract. For three weeks there had been marked nasal obstruction with pus.

Examination.—Physical examination gave negative results, except for swollen, boggy turbinal tissue with pus throughout the nasal fossae. He had suffered for several days with severe pain, referred to the ethmoidal regions. So great was the patient's distress, and so clear was the indication for some surgical treatment, that the antrums were washed out through the inferior meatuses. That this was not a case of pansinusitis was proved by clear washings from the sinuses. Roentgenographically the condition was said to be "double frontal empyema."

Operation and Course.—On the next day the boy was admitted to the Bridgeport Hospital, with a temperature of 103 F.; pulse rate, 100; respirations, 20; nasal condition unchanged; intense pain over the frontal sinuses, deafness and slight pain in the left ear. A suppurative otitis had developed during the twenty-four hours. Under local anesthesia, double middle turbinectomy and double anterior ethmoid operations were performed. The membrane of the left drum was incised, and a moderate amount of bloody serum was liberated. Severe pain was not again a source of complaint. The temperature gradually subsided, and reached normal on the fifth day.

During this period the nasal discharge was profuse. *Streptococcus hemolyticus* was isolated from the pus from both nares and from the discharge from the left tympanum. At this time there was a marked diminution in the quantity, noticeable improvement in the appearance of the nasal membrane and normal breathing. The patient left the hospital on February 24. He was clinically cured of this sinusitis, and remained so throughout his illness, but he had a discharging left ear which was not otherwise remarkable. At no time during the entire illness was there any disturbance in the right ear.

Shortly after he was discharged from the hospital, a diffuse furunculosis developed in the left auditory canal, preventing inspection of deeper parts. Posterior auricular edema with displacement complicated this infection, which disappeared as the furunculosis improved. By March 3 all evidence of the external otitis had disappeared. Up to this time, pain, except that which could be readily

1. Sears, W. Hardin: Otogenic Paralysis of the Abducens, Transactions of the Thirty-First Annual Meeting of the American Laryngological, Rhinological and Otological Society, 1925, p. 20.

accounted for by the furunculosis, temperature, loss of appetite and sleeplessness were not marked. For two days, however, before the deeper parts of the canal could be thoroughly examined, the patient's nights were sleepless. The most annoying pain was referred to the left temple and to the left external canthus. Discharge had been only moderately profuse. Lacrimation and some ocular distress also existed. On March 4 there was periostitis of the posterosuperior wall of the canal, with tenderness over the mastoid antrum; later postauricular edema and some redness were present.

Second Operation and Course.—The patient was readmitted to the Bridgeport Hospital on March 6. The temperature at admission was 103 F.; white blood count, 35,500; red blood count, 4,800,000; hemoglobin, 80 per cent; polymorphonuclears, 92 per cent. A simple mastoid operation was immediately performed. There was no cortical evidence of disease of the mastoid.

The antrum was large and deeply situated, but readily located. The cells along the posterior wall of the canal were large. Cells invaded the zygomatic area only moderately. The entire mastoid, which was rather large, was filled with granulation, pus or coagulated fibrin. Disease had not broken down any partitions between cells. No sinus or dura was exposed. *Streptococcus hemolyticus* was recovered from pus from the middle ear and also from the mastoid wound. Roentgenographically, the disease had not progressed to this extent.

The temperature reached normal by lysis on March 10, the fourth day after operation. A blood count on this day showed a drop of 29,000 in white blood cells and of 7 per cent in polymorphonuclears.

For the next three days, that is, up to March 13, the patient's condition was most satisfactory, free from pain and otherwise normal. On this day, however, the temperature rose to 102 F., and there was pain about the left temple, in and about the left eye. On March 14 the patient was most comfortable, but the temperature reached 101.5 F. There was a diffuse periostitis in the canal; discharge was profuse from the tympanum and also from the mastoid wound.

The patient had two days of comfort, March 14 and 15, with the temperature ranging about 100 F., and there was marked diminution in pus, both from the canal and from the mastoid wound. The blood count on March 16 showed 3,680,000 red blood cells; 15,300 white blood cells; hemoglobin, 65 per cent; polymorphonuclears, 58 per cent. This change in the blood picture, that is, the marked drop in the red blood cells, hemoglobin and percentage of polymorphonuclears was striking. Pain was annoying in and about the eye, examination of which gave negative results.

On March 19, the fourteenth day in the hospital, a direct transfusion of 900 cc. of blood was given. On the previous day the temperature had reached 102.5 F., after a week of ranging at about 100 F. It reached 103 F. on the day of the transfusion, was normal by March 22, having run an irregular course, and remained nearly normal until the afternoon of March 27, the twenty-second day after the mastoid operation.

On March 20 the discharge from the tympanum ceased, but the incision in the drum did not close. On this day it was noted that the patient was using only his right eye. Examination disclosed a homonymous diplopia, but no manifest squint. Edema of the left upper lid developed, lacrimation was present, but there were no changes in the fundus. These ocular signs definitely suggested Gradenigo's syndrome.

On March 24 a culture of the blood was reported sterile after five days, and a Wassermann test gave negative results. Discharge from the middle ear reappeared, pus in the mastoid wound was profuse, and the canal was swollen and furuncular. On March 27, paralysis of the external rectus muscle became manifest, making complete the picture of Gradenigo's syndrome. On the same day the temperature readings were 99 F. at 10 o'clock, 102.5 F. at 1 o'clock, and 105 F. at 3 o'clock, with a rise in pulse rate to 136, which introduced the serious

consideration of a lateral sinus thrombosis. In anticipation of the necessity of opening the lateral sinus, a second direct transfusion of blood was given that evening. At 6 o'clock in the morning of March 28 the temperature was normal, and at 11 o'clock the same day the temperature was 104 F.

At no time had there been any meningeal signs other than those which were then localized, assuming that the ocular pain, paralysis and lacrimation were due to meningitis. The most comfortable position of the head at all times had been with a rather strong flexion.

On March 28, with the temperature at 103 F. operation was performed on the lateral sinus and on the jugular vein. The wall of the sinus was in good condition, with a small amount of granulation on its external surface well toward the tip of the mastoid. Blood was flowing through the vein. On opening the vein, circulation did not seem impeded from behind, but was impeded from below. A curet introduced downward did not disclose any clots, but the return flow was increased. A small cigaret drain was used in the wound in the neck. Before the rise in temperature on March 27 and 28 chilliness was experienced, but there was not a definite chill. After this operation the temperature reached 100 F. on the evening of March 30, and remained the same until April 2, when it rose to 104 F. It gradually receded to normal on April 5, and remained normal until April 12. At this time pus appeared in the wound in the neck, and *Streptococcus hemolyticus* was again isolated.

Up to April 28, no noticeable change had taken place in the clinical picture. Symptoms in the eye were unchanged, and the temperature was somewhat elevated all the time. On this day, the pain changed to a generalized left-sided headache. There was a questionable aphasia, and the patient appeared a bit flightly. Physical examination at this time revealed nothing. The wounds were healing excellently. On April 30, the hearing seemed markedly reduced, and the patient was definitely aphasic. Examination showed a seeming loss of motion of the right side of the mouth and an almost complete absence of the right abdominal reflex. The right cremasteric reflex was absent. There was no ataxia. Cutaneous sensations were not affected. Spinal fluid on this day was withdrawn with no apparent increase in pressure. It was clear, showing 20 lymphocytes and gave a 2 plus globulin reaction. The white blood count was 24,800. Roentgenograms of the sinuses compared with those of the previous examination showed clearing of the frontal sinuses and no evidence of intracranial pathologic conditions. In the light of these developments, a provisional diagnosis of a temporosphenoidal abscess was made. Exploration of the temporosphenoidal lobe through the squama was performed on May 1. The brain, definitely under pressure, presented itself in the wound. Explorations were made with a blunt needle, with negative results. There was little reaction from this operation, as was the case following all other operative procedures; on the following day, the general condition was good, the mental condition was no worse, but the aphasia was unmodified. During the night, however, there were two attacks of projectile vomiting and loss of bladder control.

On May 3 the patient was semicomatose. At this time there was definite paralysis of the right side of the face, a diminution in the muscular power of the right arm, an increase in the patellar reflex and a modified plantar reflex, but not a Babinski reflex.

Interference with respiration was first noted during the early part of the evening. There were periods varying from 20 to 45 seconds, during which the respiratory movements were absent.

During the next ten days the patient's mental condition was much improved, although he was definitely confused a considerable part of the time. Aphasia was absent at intervals, during which familiar sounds were recognized, and objects were recognized both by sight and touch.

On May 10 swelling and edema were present about the incision in the scalp in all directions. The incision in the skin was opened in the center for one-half

inch (1.2 cm.). About 1 drachm (3.7 cc.) of pus was liberated, which, on culture, showed *Streptococcus hemolyticus.*

Following the infection of the scalp, the boy's general condition, both mental and physical, seemed improved. He remained aphasic, but could answer or ask questions intelligently, and was able to recognize individuals. He took large amounts of nourishment.

From the date of the cerebral exploration, May 1, for about a week, the temperature ranged from about 100 to 102 F. For the next ten days it was normal. No remarkable conditions were recorded in the pulse until May 6 and again on May 10 when the record showed a rate of 60. During this week there had been no undue changes in the boy's condition, except such as might be due to too long hospitalization.

It seemed that further exploration would be justifiable, but the parents decided against the procedure, because of the great uncertainty of localization, as the frontal lobe had to be seriously considered then. Home conditions being perfectly satisfactory for a prolonged convalescence, which was to be expected if the boy recovered, he was discharged from the hospital on May 17.

For nearly eight weeks the patient experienced moderate "ups and downs." During this time, a dome-shaped mass of granulation, 1 inch (2.5 cm.) in diameter, developed over the center of the incision in the scalp, and on two or three occasions pus became dammed back somewhere in it. Wick drains were used until the second week in June, after which no more pus appeared about this wound throughout the illness.

The patient was placed outdoors at regular intervals, his appetite steadily improved, and it was estimated that there was a gain of approximately 25 pounds (11.3 Kg.) in weight, a pleasing gain over the loss of 40 or 45 pounds (18.1 to 20.4 Kg.) which began with the onset of the grip, thought to have been during the week of January 19. Within a month from the time he left the hospital he was up, fully dressed, going to the table for meals, and was for the most part normal in his mental reactions. At no time, however, could he be questioned for any length of time without showing an aphasia.

The mastoid wound healed with little deformity during the second week in June, with the tympanum dry and the incision in the membrane closed. Pain was not remarkable except at intervals. On one occasion, on June 21, after a short automobile ride, which he took through a misunderstanding, he came home exhausted, apparently in distress, and went into a semicoma which lasted for several hours, leaving him weak for about two days. He was usually cheerful and alert, but always aphasic. On July 4, the pupils, which had always responded to light and accommodation, were as usual; fields were normal, but the outlines of the nerve heads were not distinct. These were the first and only changes noted in the fundus up to this time. There was a marked improvement in the paralysis of the external rectus muscle; the facial paralysis was much improved, and there was no ataxia of the arms and legs. There was an astereognosis in the right hand, in which the patient was unable to distinguish familiar objects by touch. He was also somewhat uncertain at times when a similar test was applied to his left hand, but he was eventually able to recognize the denomination of a small coin placed in that hand. There was slight atrophy of the right upper extremity, but sensation to touch and pain was preserved. The reflexes of the upper extremity were normal, as were the knee and ankle jerks. The right abdominal reflex was practically absent; the left was present, but it varied occasionally and was diminished on repeated tests. He had no Babinski reflex. Pulsation at times had been manifest at the site of the cerebral hernia over which the epithelium had almost closed.

On July 9, although he was without complaint, and had been up and fully dressed, it did not seem that his mental condition was as good as usual, and there was a definite increase in the size of the cerebral hernia. Trouble was anticipated. That night the patient showed a marked increase in intracranial

pressure with pain; the hernia increased to twice its former size; he vomited, and pupillary changes were present. The patient went into a semicoma and died early on the morning of July 15. From this last coma he could be aroused to the apparent understanding of questions and the recognition of those familiar to him to the very end.

The skull was opened post mortem, and disclosed a moldy, inflammatory exudate in the floor of the left middle fossa. A destructive otitis on the superior border of the petrous portion of the petrous bone near the apex had produced a concavity three eighths of an inch (0.8 cm.) in depth, and a large encapsulated abscess was found in the temporosphenoidal lobe, filled with a moderately thick, greenish yellow pus, the bacteriologic examination of which was not satisfactory. The capsule of this abscess was extremely dense, half an inch (1.27 cm.) thick in some areas.

Capsule of an otitic abscess of the brain. The temporosphenoidal sac was removed intact at autopsy 150 days after the onset of acute suppurative otitis media.

COMMENT

The severity of this illness was manifest when the patient was first seen, although five months elapsed from that time until death. One was reminded of the severe grip of 1918-1919, in which medical and surgical efforts achieved little except the relief of pain. Despite prompt and what proved to be efficient treatment of the suppurative sinusitis, an acute suppurative otitis developed. Nasal packing was not used except temporarily, for the purpose of anesthesia.

It is admitted that the clinical observations which were thought to be the manifestation of a septicemia due to involvement of the lateral

sinus may have been clinical manifestations of cerebral invasion. Likewise, from the laboratory point of view, a septicemia was not proved. Clinically, it would seem that such a diagnosis was justified; otherwise it is difficult to account for the finding of the hemolytic streptococcus in so many different areas, unless it is assumed that such organisms were lying attenuated within the structure of this patient, ready to become activated under the influence of localized loss of tissue resistance.

The paralysis of the sixth nerve was considered a localized meningitis. Because of the violence of the intracranial inflammatory reaction, this point could not be determined at autopsy.

It is to be noted that there were no dural exposures made at the time of the mastoid operation. Theoretically, it seems that it would have been an advantage if such exposures had been made.

It is my impression, however, that most physicians feel chagrined at accidental (or what could be termed unnecessary, in a large percentage of cases) exposures of sinus or dura. Experiences such as narrated in the management of this and similar cases prompt the question as to whether accidental or purposeful exposure of the dura or the sinus, either or both, have influenced subsequent events. Experience with apparently simple cases in which the sinus was accidentally exposed and which subsequently became thrombosed leaves the question of exposures through accident or with the idea that they may later become of therapeutic value a problem yet to be determined.

The thickness and density of the capsule of this abscess brings to mind again the uncertainty of the nature of the reaction of cerebral tissue to infection. Encapsulation per se depends on other factors than time, as is shown by the fact that abscesses of long standing, so far as can be determined, are found encased in only a thin layer of necrotic brain tissue.

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INTRANASAL SURGICAL TREATMENT OF CHRONIC MAXILLARY SINUSITIS *

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Surgical treatment for chronic maxillary sinusitis may be either radical or conservative; definite and rigid rules cannot be laid down, for treatment must suit the individual case. There are cases in which only a radical operation will suffice, but usually conservative measures will restore the antrum to a normal state. It is generally agreed that if the antrum is filled with polyps, it must be attacked radically; but one is often astonished at the resolution which takes place after thorough drainage and ventilation have been established by conservative measures. The mucosa of the antrum has great ability to repair, and the sinus equipped with ciliated columnar epithelium is better able to perform the normal function than one lined with stratified squamous epithelium. An endeavor should be made to accomplish the maximum of restoration with the minimum of destruction.

Many authors hold that all surgical treatment should be radical, but the infra-orbital neuralgia, the devitalization of the teeth and the anesthesia of the cheek which follow such a procedure are so troublesome to the patient that they are an argument for conservative measures. On the other hand, antrums with partitions and dense antronasal walls demand radical procedures. All operations on the antrum for the purpose of exploration are best undertaken through the canine fossa.

It may be said in general that the more formidable radical operation should not be performed until an effort has been made to eradicate the disease by means of the antronasal operation.

In order to determine the benefits derived from conservative surgical treatment for chronic maxillary sinusitis, I studied the histories of 385 patients so treated. An effort was made to determine the etiology of the infection and thereby to ascertain whether certain types of disease of the antrum would respond to conservative methods. Most of the patients could not give the date of the onset of symptoms, nor did they know whether it accompanied a cold in the head. Many were able to trace the infection in the antrum to a diseased tooth or to its extraction. In 22.5 per cent of the cases, the infection clearly followed the extraction of abscessed molars. Abscessed teeth have, no doubt, been

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* From the Section on Otolaryngology and Rhinology, Mayo Clinic.

* Read before the Section on Laryngology, Otology and Rhinology, at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May, 1927.

the cause of many more, but the association has not been easy to establish In sixty-three cases there was a fistula from the antrum through the alveolar process.

The antral infection of dental origin was usually marked by several characteristics: the infection was confined to the antrum and was unilateral; the upper sinuses were not involved; the pus was foul-smelling, similar to that associated with infection by the colon bacillus; polyps had not formed and healing was unusually rapid after the institution of suitable drainage and ventilation. Roentgenograms are always taken after extraction of teeth to be sure that infected roots do not remain to feed the antrum.

When the antral infection originated in the nose, it was often associated with infection of the upper sinuses, and in many cases the antrum acted merely as a reservoir. The pus was different in character and odor from that associated with infection of dental origin. Polyps were sometimes present either in the antrum or in the nose; they were bilateral in many cases. The antrum did not heal so quickly, and in a few cases the operation was followed by an acute infection of the pharynx and tonsils.

TECHNIC OF OPERATION

Anesthesia is induced by means of cocaine-epinephrine mud on applicators placed in the region of the anterior ethmoidal nerves and the sphenopalatine ganglion. A pledget of cotton soaked in a 10 per cent solution of cocaine is placed under the lower turbinate. The mucous membrane at the anterior end of the lower turbinate is injected with a one fifth of 1 per cent solution of cocaine. An incision is made through the anterior attachment of the lower turbinate, so that it can be broken upward and the lower meatus exposed to full view. If a flap is desired to cover the edge of the window, the mucous membrane, together with the periosteum, can be dissected free at the time. The Wilhelminsky trocar is inserted about half way back, and the wall is broken through. This allows the introduction of the cutting forceps, and the window is enlarged posteriorly as far as desired. With a modified Kerrison punch, the window is brought far forward and down to the floor of the nose. An attempt should be made to obliterate the anterior angle. If the window is made sufficiently large and brought well forward there is little likelihood of its closing, particularly if the flap of periosteum and mucous membrane is saved and laid over the raw edges. An effort is made to make the window level with the floor of the nose. The edges can be smoothed with either the rasp or the hand burr. The antrum is then cleaned with the suction tube, with the least possible trauma. The curet is not used in the antral cavity. The nasal speculum can be introduced and a fair view of the greater part of the cavity obtained.

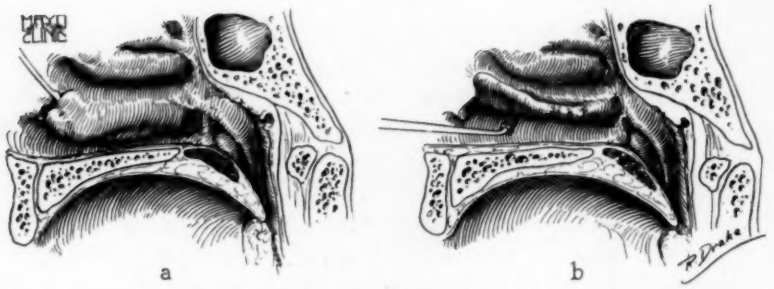

Fig. 1.—*a* represents the cutting of the anterior attachment of the lower turbinate, and fracturing it upward; *b*, the introduction of the Wilhelminsky trocar.

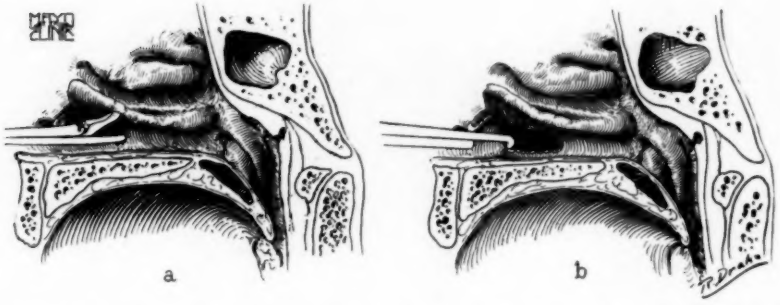

Fig. 2.—*a* represents the enlarging of the window posteriorly; *b*, the enlarging of the window anteriorly with the Kerrison punch.

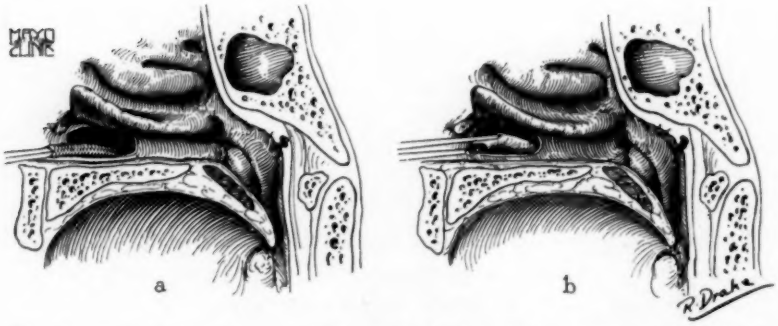

Fig. 3.—*a* represents the smoothing off of the window with the rasp; *b*, the wiping out of the antrum with cotton for inspection.

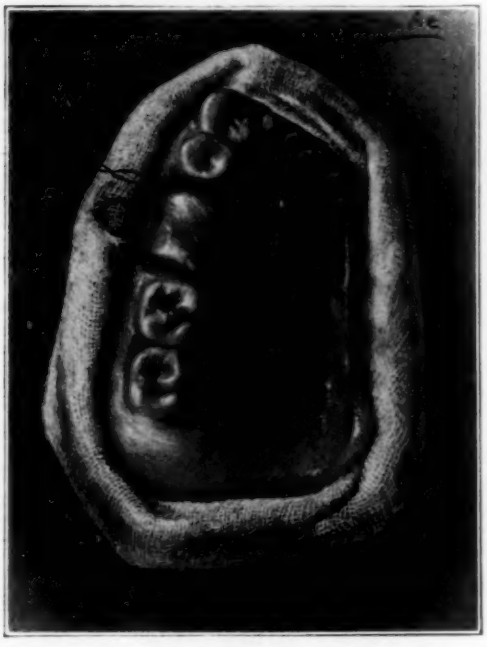

Fig. 4.—Gardner's method of suturing periosteum flap over the fistula

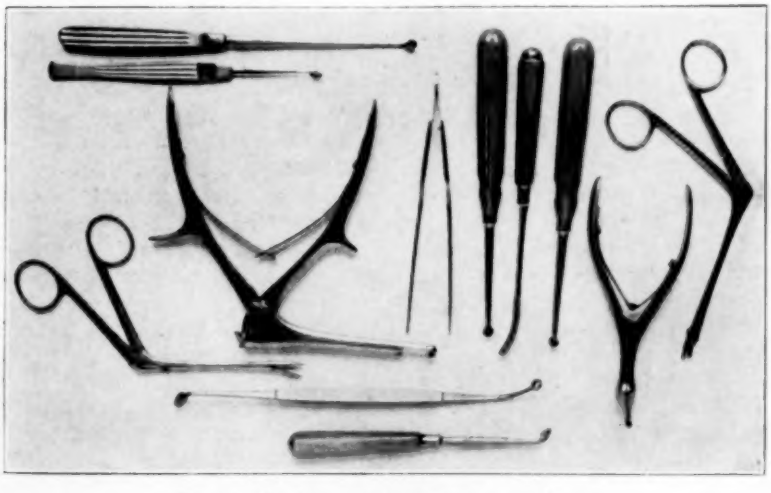

Fig. 5.—Instruments used for operation.

EXTENT OF OPERATION

In two cases, it was necessary to perform the radical operation through the canine fossa. In both cases the antrums were filled with polyps, and it was not possible to remove them by the nasal route. In two cases osteomyelitis of the maxilla followed: one patient died and one recovered. The fatal case was complicated by severe bilateral bronchiectasis and marked inanition. Stenosis of the tear duct with epiphora was seen in three cases. In four cases membranous closure of the window occurred, and a second operation was necessary. The average time of treatment was fourteen days.

POSTOPERATIVE TREATMENT

Packing is not placed in the cavity and further treatment is carried on by means of dry suction. Irrigation is never resorted to, as it causes a water-logged condition of the mucous membrane which is unfavorable to healing. Large fistulas often close after the described treatment; if not, they are closed by elevating the edges and sliding over a flap of periosteum and mucous membrane from the palatal side, as advocated by Gardner (figs. 1 to 5).

CONCLUSION

The conservative operation has the following advantages: 1. It is easily and quickly accomplished under local anesthesia. 2. Loss of turbinate tissue does not occur. 3. The reaction is much less severe than that following the radical operation. 4. A minimal amount of injury is inflicted on the lining mucous membrane, which is thereby given a chance to return to normal function.

DISCUSSION

DR. HORACE NEWHART, Minneapolis: Dr. Hempstead has left no room for doubt concerning the advantages of the endonasal treatment in a large percentage of these cases. In fact, his conclusions are final and indisputable. At the outset he has excluded all the cases of polyposis of the antrum. The achievement of these excellent results suggests most emphatically the importance of a correct diagnosis of all cases of disease of the maxillary sinus and the recognition of the latent types as well as polyposis, and the rarely met malignant involvement of the antrum. Accurate diagnosis of the antrum has been made materially easier by the use of iodized oil 40 per cent. In my own practice I have possibly leaned too far in the direction of the radical Caldwell-Luc operation, which in the last analysis is not as serious an undertaking as is generally supposed, and which yields uniformly good results. Many of the cases which come to us are of long standing, have often been greatly neglected, or the patients have already received surgical treatment by the endonasal route, with recurrence of the symptoms. In all these cases a radical operation must be performed. The fact that some cases of years' duration, often with foul-smelling pus, the patients recover completely after a few or even many irrigations, is a strong argument in borderline cases for at least giving the endonasal operation a trial before resorting to the more

radical procedure. I am heartily in accord with the essayist in regard to a simplified after-treatment following operations on the maxillary sinus. Even in the radical operation, packing for more than one or two days seems desirable; and irrigation is unnecessary, for drainage through the large window cares for the secretion.

Dr. William Mithoefer, Cincinnati: It is a matter of common knowledge that disease of the antrum is often caused by a disease of the nasal sinuses higher up and that the antrum itself is only a reservoir for the infection in the ethmoid and frontal sinuses or even in the sphenoid sinus above. It is, therefore, not advisable to operate on an antrum without first giving the other sinuses a careful examination. I refer to the so-called "hiatus suppuration," which is so often present and which, if not recognized, will cause a continuance of the suppuration from the antrum. Many patients are relieved of their suppuration by careful treatment. In other words, operation is not necessary in many instances if two or three weeks are allowed to elapse and the antrum is irrigated with hypertonic salt solutions, and the ethmoid cells are carefully examined and treated. I should like to ask Dr. Hempstead how long these patients were treated prior to operation. I should also like to know what examination was made in order to exclude the presence of ethmoid suppuration. If we wash out an antrum and find pus, in order to exclude disease from higher up areas, we must put in a diagnostic tampon, allow it to remain for two or three hours, then remove it and again wash out the antrum. If the antrum does not contain pus at the end of this time and there is pus on the cotton, it is reasonably sure that nasal sinus disease is present in the upper cells. I should also like to ask Dr. Hempstead whether he has communicated with any of his patients after operation, for I understand that the majority of them do not live in Rochester, and I should like to know how many patients had a recurrence of the infection during the following winter.

Dr. Sidney R. Israel, Houston, Texas: In my experience, a great many of the patients in these cases have undergone the usual treatment for acute maxillary sinusitis, and, therefore, have passed over the threshold from the acute into the chronic stage. The determination of chronicity, however, is one of the most important points, in my opinion, concerning the ultimate prognosis or treatment. Dr. Hempstead did not say exactly what he meant by chronic maxillary sinus infection from a histologic standpoint. With the method that Dr. Hempstead has recommended, it is difficult to see how one would have access to all portions of a large maxillary sinus by the intranasal approach. With a large maxillary sinus, an intranasal operation is useless, because it cannot be complete. The operation of the type recommended by Ballinger and Canfield—that is, the intranasal incision, with exposition of the canine fossa, opening the sinus there and taking down the anterior angle—appears to me to be the most complete operation of that type, but it also has the same objection, if a large sinus is present. The question as to whether these are cured patients by an intranasal operation is interesting. In my experience, involution following a distinct chronic invasion of the maxillary sinus, that is, complete involution, is rare. That the patient obtains some relief from the drainage and ventilation, there is no doubt, but that the patient has recurrences of the inflammation or infection of the sinus under the proper stimuli or stimulus, I think, there is also no doubt.

In such instances as Dr. Hempstead mentions we have not had any especial difficulty with the objections to the radical operation when it was indicated. For a period there may be numbness or anesthesia. There may also be occasional pain, but if the infra-orbital nerve is carefully avoided during operation, and

if the treatment of the soft tissue has not been unduly radical, I think the objections of Dr. Hempstead are not serious. Regarding the devitalization of the teeth, if the nerve supply of the teeth is kept in mind, it will be found that as much damage can be done from the intranasal operation on the maxillary sinus as can be done by a so-called radical operation over the alveoli. If care is taken in respect to the floor of the sinus, if too much of the bone forming the canine fossa below is not removed, and if the use of the curet is avoided, the dangers of injury to the teeth are minimized.

The classification of chronic sinus infection is most interesting. Dr. Hempstead did not discuss that, but the point that I wish to emphasize is that complete involution following chronicity is rarely seen under the microscope.

Dr. J. A. Pratt, Minneapolis: It is a great pleasure, after fourteen years, to hear a man talk about conserving the turbinal tissue. As a rule, this has been freely destroyed. Another thing that one is apt to forget in intranasal work is the part played by the thick, deflected septum, which must be operated on in order to have space to work, if one expects to be successful in one's line of work, particularly in work on the sinuses. In breaking up the lower turbinate and giving room, I use a Killian long blade nasal speculum, with which I get under the lower turbinate, and with good leverage fracture it up. If it is necessary, however, I cut also. There is another point on which there is a great deal of trouble with some operators, and that is in the closure of the opening. I found that it was due to cutting too low on the floor. It seems as if we should have a low opening into the antrum, but in nearly all patients the antrum is far below the floor of the nose, and ventilation and draining can be easily obtained by having the opening higher. Assuming that he has made a correct diagnosis of chronic maxillary sinusitis, I think that the method which Dr. Hempstead proposes is the best ever practiced in maxillary sinusitis. I have operated on a great many patients with chronic maxillary sinusitis by this method, or with certain modifications with satisfactory results. The cardinal principles of treating patients who have sinusitis are here emphasized, that is, ventilation and drainage. If one gets ventilation and drainage in the sinuses, the majority of patients will get well. I have found this swollen mucosa in the antrum, as seen with the antroscope, and after making a large opening in the naso-antral wall, as Dr. Hempstead proposes, I have watched the mucosa. I could almost see the tissue subsiding daily when ventilation and drainage had been established. I cannot emphasize too strongly the great value of this operation. It is conservative, and the results are splendid. I have watched these cases for many months, and the results are excellent.

Dr. R. G. Reaves, Knoxville, Tenn.: What I have to say has already been brought out in discussion. I merely want to substantiate what Dr. Hempstead has said that good results can usually be obtained by the intranasal operation. I have been performing the operation just about as he described, with little difference in the after treatment for some time. I have not been cutting the end of the turbinate loose, but simply raising it up with the Hartmann forceps, so as to give me a good view of the inferior meatus. I have seen large polyps subside, after obtaining sufficient drainage and ventilation. I have had a few failures, and on carefully studying my cases I have found that practically all of my failures have been due to infections of the ethmoid, the suppuration being kept up by the infection above. I now go back and clean up the ethmoids. I have a few more patients on whom this must be done, and I believe I will get good results after that work has been done. In some bad cases in which there is

infection of the ethmoid, I have also resected the wall in the middle meatus, because often there is a lot of boggy tissue that hangs down into the antrum, and I think that is important in those cases.

Dr. Bert Hempstead, Rochester, Minn.: With regard to the chronicity of these cases, or whether or not other sinuses were involved, I did not take that up because my paper was to be simply on the treatment in chronic cases, the intranasal treatment. I do not mean to infer that the intranasal treatment is 100 per cent perfect. As I stated, there are certain cases in which the patient must be treated radically; intranasal treatment will not suffice. But in the cases in which there is involvement of the upper sinuses, it necessarily must be taken care of at the same time. I simply wanted to make a plea for less radical procedures on the antrum. This must be modified somewhat, according to the case, as I stated in my first paragraph. With regard to the last discussion, there are cases in which the lateral wall higher up must be resected, but I simply want to make a plea for less radical treatment. With regard to the following up of these cases, I make an effort to keep these patients in the clinic until the antrum is dry. If other intranasal operation is necessary, such as deflection of the septum or some such procedure, that is taken care of, but in most of these cases, if there is doubt whether the intranasal work can be done and if it is necessary to perform radical operations later, they can easily be carried out.

SURGICAL CORRECTION OF CLEFT LIP AND CLEFT PALATE*

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My paper is presented for the purpose of creating more interest in a procedure which should be a part of the work of the rhinologist. Especially is this true for those who are surgically inclined, for the reason that in the surgical correction of cleft lip and cleft palate a knowledge of nasal surgery is essential in order to give the best cosmetic results, and to increase the functional activities of the nasal chambers. It therefore follows that surgical correction alone of cleft lip and cleft palate does not suffice to procure the desired results. The operative procedures which I shall describe are not original, but are a combination of methods which have given me the best results, after trying several of the universally employed operations during the past twelve years.

Briefly stated, cleft lip and cleft palate are malformations due to nonunion of certain embryonic processes.

CLEFT LIP

I have adopted the term cleft lip, as suggested by Dr. T. W. Brophy, in place of hare lip, which term was derived from the condition's supposed similarity to the lip of a hare. The cleft in this animal is in the median line, and has slight resemblance to the malformation of the human family; hence the use of the more scientific term, cleft lip. The clefts are single or double, and may vary from a slight notch to a complete slit of the lip; incomplete when it does not extend to the nostril, and complete when it reaches its floor. Patients are seen with a complete cleft on one side, and with an incomplete one on the other. A rare type is a median cleft. The etiology of cleft lip is not known, despite the various theories that have been advanced. The surgical procedures described in this paper will deal only with complete deformity of the lip and palate. From a review of the literature on the subject, it is noted that there is great diversity of opinion as to the choice of age for an operation, and whether the lip or the palate should be corrected first. My preference is for repair of the lip first, this being accomplished as soon after the third week as possible, and not later than the fourth month if it can be avoided, for the following reasons: 1. The pre-

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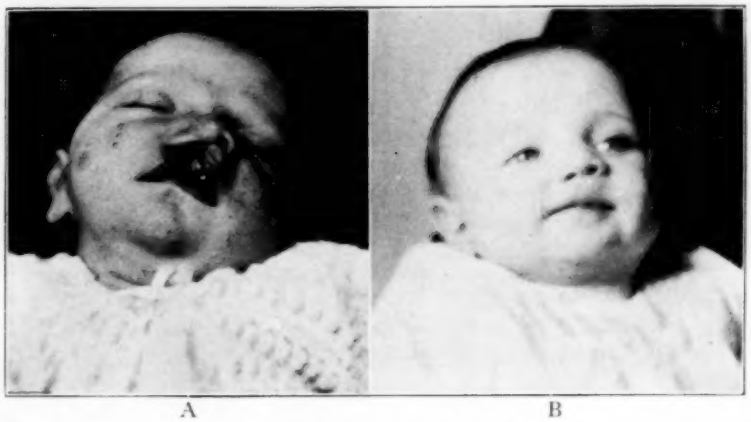
maxilla and vomer bones begin to ossify about the fourth month, with the result that molding of them becomes progressively difficult. 2. Early closure of the lip will cause the margins of the alveolar cleft and palate to approach each other, and the premaxilla will be gradually forced into place in most cases by the constant muscular action of the lip. 3. Improvement in nasal breathing and in the facial appearance results. 4. There is less shock in consequence of the immature development of the nervous system. 5. Mental anguish of the parents is relieved by early repair of the lip.

Preliminary to the operation, fluoroscopic or roentgenographic examinations should be made of the thymus gland; for, according to Mosher, Macmillan and Motley, in a series of nearly 5,000 consecutive cases in which roentgenographic examinations were made, 7 per cent of the



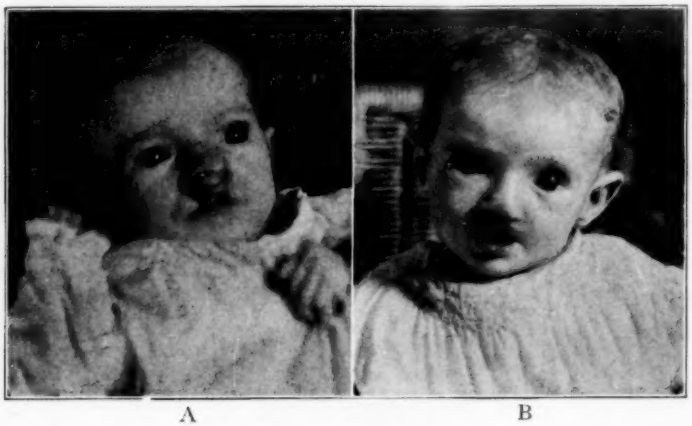
A B

Fig. 1.—*A*, complete single cleft lip and cleft palate; *B*, same, five months after operation.

children from 2 to 16 years of age had enlarged thymus glands. In consequence of this investigation and the danger of thymic death, it is wise to learn the size of the thymus, and to reduce it to normal with the roentgen ray before performing any operation on infants and children. It is desirable to have the nutrition brought to the highest state possible. As bottle or breast feeding should not be allowed for ten days after operation, the child should become accustomed to being fed with a spoon or a medicine dropper. A blood coagulation test is necessary to guard against hemophilia.

Acetone or diacetic acid in the urine calls for alkaline treatment several days before the operation. If the hemoglobin is below 75 per cent, operation should not be performed. The nose is sprayed with an alkaline and antiseptic solution immediately before the operation. The lip and face about the mouth and nose are painted with a solution com-

posed of mercurochrome-220 soluble 2 Gm., distilled water 35 cc., acetone 10 cc. and alcohol 55 cc. Ether vapor is given for anesthesia, through either a tube in the nose or one which is hooked into the angle of the mouth. The anesthesia should be light. Whatever surgical procedure is adopted for cleft lip, it is necessary to separate the lip,



A B

Fig. 2.—*A*, complete double cleft lip and palate; *B*, same, two months after operation.

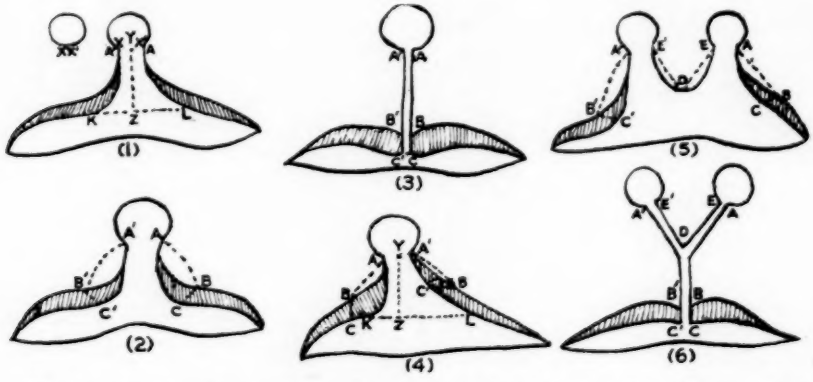


Fig. 3.—Thompson's operation for single and double harelip. (From Davis' "Plastic Surgery," courtesy P. Blakiston's Son & Co.)

nostril and cheek from the underlying bone, with a pair of curved Mayo scissors. The undercutting is done so that the cleft margins may be approximated without tension. After trying a variety of methods, I am now using a procedure which Dr. J. Stage Davis describes in his book entitled "Plastic Surgery" as a modification of Dr. J. E. Thompson's operation.

TECHNIC

In brief this method is as follows: After the lip, cheek and nostril are separated from the underlying bone, a pair of sharp pointed compasses regulated with a screw is used, and a measurement (*YZ*, fig. 3) is taken from the level of the opposed corners *A* and *A'* directly downward, of such length that *Z* would be on an imaginary line *KL* which would complete the natural curve of the upper lip. The points of the compasses are fixed apart at this distance (*YZ*) and measurements taken in the lip on each side of the cleft (diagram 2, fig. 3) commencing at *A* and *A'* respectively, and passing to *B* and *B'*. The points *B* and *B'* are each close to the junction of the skin with the red line of mucous membrane, and so placed that *AB* is equal in length to *A' B'*, and each one is the same length as *YZ*. The points *B* and *B'* are marked by pricking the skin. A measurement from *B* to *C* on the lip margin is taken. The angle which *BC* makes with *AB* is about 60 degrees. A similar point *C* is taken on the other side of the cleft. The lip is transfixed with a narrow bladed knife at *B* and carried through with a curved sawing sweep to *A*. The lip is then divided along the line *BC*, and the tissue outlined by *ABC* is removed. The same maneuver is carried out on the opposite side of the cleft. The two raw surfaces on each side of the cleft should be of equal length. The sides of the wound can now be brought together with the result shown diagrammatically in section 3, figure 3.

The treatment of double cleft lip is shown in diagrams 5 and 6, figure 3. The shoulders marking the margins of the nostrils are shown at *A* and *E*, and at *A'* and *E'*. The triangle *E' D E* shows the line of incision by which the central piece of skin covering the premaxillary bone is pared. The sides *DE* and *DE'* are usually equal in length to one another, and their length varies according to the depth of the central piece of skin. It must never be greater than *AB*. The points *AB* and *C*, and *A'B'* and *C'*, are chosen as described previously in the operation on single cleft lip. Diagram 6, figure 3, shows the lip when the flaps have been cut and brought together. The circumference of the nostril must not be encroached on. The shoulders that represent the margins of the nostril should be accurately approximated. The points *B* and *B'* are made as close to the red line of the lip as possible, and must be on the skin (upper side) of this line.

Complete cleft lip is usually accompanied by a cleft palate and a protruding premaxilla. This bony prominance should not be forced back more than is necessary to approximate the lip borders. Neither should it be wired or sutured, for the following reasons: The developing incisor teeth may be injured sufficiently to destroy them; or if not traumatized they may erupt behind, instead of in front of, the lower teeth, thus giving a flat appearance to the upper lip. The natural position of the premaxilla is in front of, and not between, the maxillae; and if so placed, it will interfere with the closure of the anterior borders of the cleft palate by keeping the maxillae apart. In most cases, if the lip is properly corrected, the activity of the muscles of the lip and face will gradually bring the premaxilla into normal position. If the premaxilla projects so that it is impossible to close the lip over it, a wedge-shaped piece of the septum may be removed from its free margin, and sufficient pressure used to allow the lip to be closed over it. I have seen

cases of double cleft lip and cleft palate in which the premaxilla protruded to such an extent (fig. 4) that it was necessary to resort to Reich's method (fig. 5). This operation is done by separating the philtrum from the premaxilla by a cut upward and backward through the septum, and the removal of a wedge-shaped piece of the posterior part of the septum from between parallel incisions of its mucous membrane.

Suturing of the lip is done by Dr. G. B. New's method as illustrated (fig. 6). I prefer medium "dermal" for both skin and mucous mem-

Fig. 4.—Double cleft lip and palate, with snoutlike premaxilla.

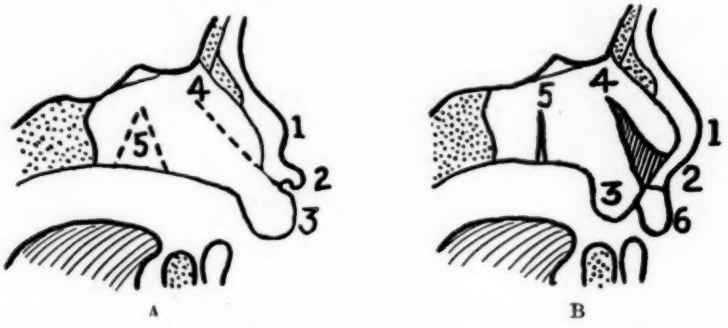


Fig. 5.—Reich's operation for repression of the intermaxilla (Binnie). In *A*, *1* indicates point of nose; *2*, philtrum; *3*, intermaxillary bone; *4*, oblique section of the septum and *5*, wedge of septum to be removed. *B* shows the position of parts after removal of septal wedge and adjustment of parts. (From Davis' "Plastic Surgery," courtesy P. Blakiston's Son & Co.)

brane sutures, the knots in the latter being so placed that they will be on the posterior surface of the lip. Dressings are not used, as they gather secretions which predispose to infection. The mercurochrome, acetone, alcohol solution is painted on the suture line. The hands should be secured by pinning the cuffs to the clothing, or by placing cardboard tubes over the arms. Paregoric is administered for restlessness. Sterile water may be given with a dropper or spoon every two hours for ten

hours, after which time the feeding of sterile liquid food may be commenced. The mouth and nose are cleansed with physiologic sodium chloride solution, and boric acid ointment is used to soften the hardened secretions.

CLEFT PALATE

Years ago, I used the Brophy plan of transfixing the maxilla with wires, but I abandoned it for the mucoperiosteal operation with which I was successful. Within the past year, I have substituted the bone flap operation which was devised and described by Dr. G. V. I. Brown in a paper read before the Section on Surgery of the American Medical Association in April, 1926. I have used this procedure sufficiently to say that it is ideal in cases of complete cleft palate, and will quote Dr. Brown's description of the method, which is as follows:

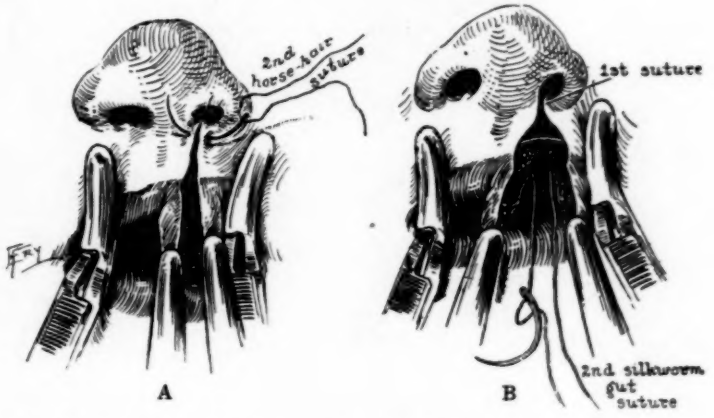


Fig. 6.—Operation for single complete harelip (New); *A*, the first silkworm gut suture is tied and the second is placed; *B*, the skin is approximated with horsehair. (From Davis' "Plastic Surgery," courtesy P. Blakiston's Son & Co.)

It is necessary to distinguish the complete from the incomplete palate fissures because the bone flap is not favorable for the closure of fissures of the velum in which the bone is not involved and in such cases the von Langenbeck-Warren types of procedure are indicated.

Incisions are made on both sides of the palate in an anteroposterior direction along the line of and just inside the alveolar ridge in edentulous infant cases, and, if teeth have been erupted, just sufficiently away from the linguogingival border to prevent injury to tooth roots. A chisel is forced directly through the external hard surface of the fragmentary palatal bone structure into the cancellous structure and then inclined toward the palatal fissure border.

It is occasionally necessary to direct the chisel backward also in order to cut through the palate bones. Usually a temporary sponge packing is required on one side, while the incision is made on the opposite side. The packing can then be removed from side to side as indicated and the work continued without disadvantageous hemorrhage.

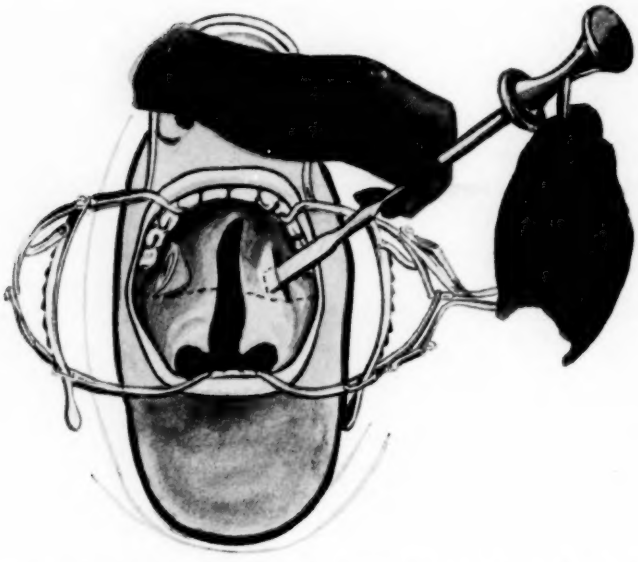


Fig. 7.—First step in the new bone flap operation: chisel is shown as used in separating the bone fragments, and the packing inserted to control hemorrhage on the opposite side as described.

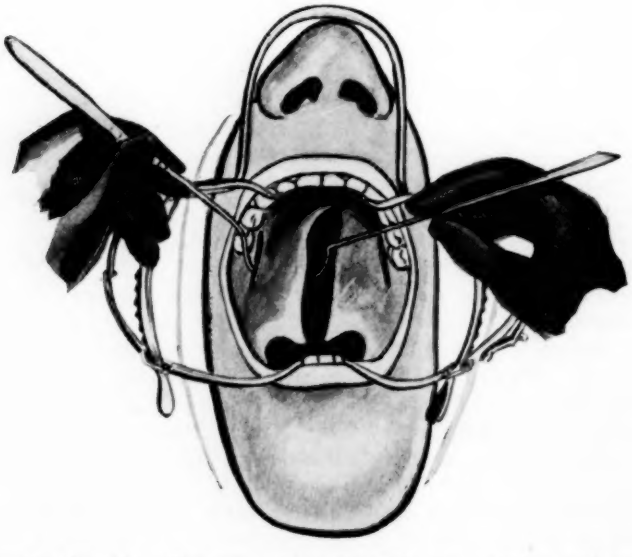


Fig. 8.—Passing the silkworm suture through the opening and around the separated bone and overlying tissue, to be again passed in the same way to enclose the bone flap on the opposite side.

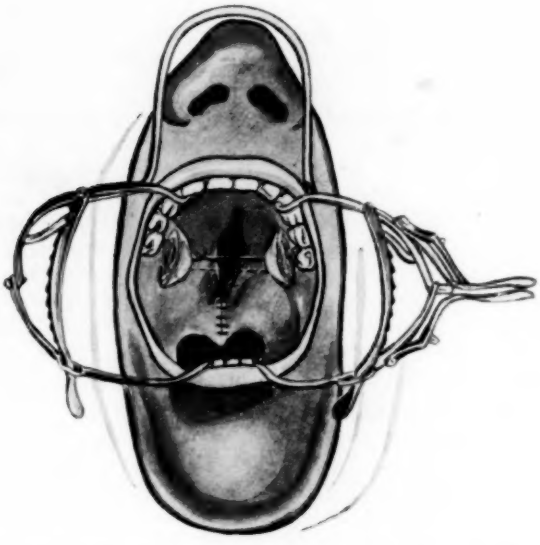


Fig. 9.—The first step in the operation completed, showing the silkworm gut suture tied and the parts drawn in contact, the packing on each side inserted and the velum closed. Usually it is possible to close a little farther forward than is shown in the illustration.

A B

Fig. 10.—*A*, notched lip and flared nostril from incorrect repair of cleft lip; *B*, same corrected.

Pressure inward and slightly upward causes the necessary fracture and permits both sides of the palate fissure to be brought into immediate contact at a point between and slightly anterior to what in normal cases would be the outline of the posterior border of the palate bones and also throughout the extent of the soft palate (fig. 7).

A stiff trochar, pointed, curved needle or a special staphylorrhaphy needle, which I frequently use, carrying two strands of silkworm gut, may then be passed into the incision on each side of the palate, through at the point of fracture of the bones into the fissure and out through the similar bone separation on the opposite side (fig. 8). The double silkworm gut then encloses the bone fragments with the otherwise undisturbed overlying, underlying and surrounding tissue, and when tied in the center holds the parts so firmly that without fear of tension the palate may be completely sutured from the tip of the uvula up beyond the posterior part of the hard palate and sometimes quite through its central portion (fig. 9).

My preference is to use no. 2 pyoktanin catgut with horsehair coaptation sutures. Gauze strips with tape attached are then packed firmly into the openings on each side where the incisions have been made, and the bones moved toward the central line. This is sealed with collodion and the tapes attached to the cheeks on each side with adhesive tape to give additional security and facilitate their removal. Five days later the packs are removed unless there should be some contraindication to remaining so long, and this very seldom occurs. Before the final packs are placed at the conclusion of the operation, one or two catheters are passed through the nose to prevent blocking of the nasal passages by the pressure of the packing.

Sometimes the catheters are allowed to remain until the packings are removed, or they may be taken out after having served their purpose in preventing nasal blocking with the packing. Occasionally there is difficulty in passing them because of nasal obstruction, and therefore they are not used; but it is preferable to have them placed, if practicable.

The second step may be done according to any of the recognized methods of the mucoperiosteal flap operation, but my own preference is the von Langenbeck plan, with suitable modifications.

At from 6 to 9 months old the first step palate operation should be done, and one year later the final operation to make the parts complete before wrong speech habits have become established.

ABSTRACT OF DISCUSSION

Dr. V. G. I. Brown, Milwaukee: Dr. Jobson's results prove the truth of his principles. Those principles, briefly stated, are, first, that he accomplishes the necessary surgical steps with the least possible traumatism and injury; that he does this at a sufficiently early age to favor the developmental improvement of which nature is capable, and without which none of us would have good results. His preparation is well chosen, especially the coagulation time test and the roentgenogram of the thymus. Both of these are routine in my practice. Nevertheless, one must remember that neither is reliable.

However, when there is an unfavorable indication, I find that roentgen-ray treatment followed two weeks later by operation, has obviated trouble in those cases. It does not make any difference what the steps of the operation are, so long as they are in the right direction and lead to the right place. I am greatly honored that Dr. Jobson has seen fit to adopt and report so favorably on the operation that I have suggested.

DR. GEORGE M. DORRANCE, Philadelphia: I do not believe the books and monographs have as yet told the entire story of the cleft palate, because I see too many persons with cleft palates on which operations have been performed, who do not speak distinctly. I have analyzed my cases carefully and find that they can be classified in several groups: first, those cases in which the repair was perfectly satisfactory but the palate was too short to touch the posterior wall of the pharynx. This, of course, made it impossible for the person to articulate certain letters. Then there is the group of cases in which the operation was a partial failure and for some unknown reason, the patient did not return for later treatment. There are cases in which the regulation of the teeth had been omitted. These patients had difficulty with the enunciation of the letter "s," etc. In some cases no instructions have been given the patients in regard to speech training. It was a disappointment to me when I realized that these persons could not speak distinctly after a perfect closure of the cleft palate.

I am glad to see that Dr. Jobson is giving up Dr. Brophy's idea of drawing the alveolar margin toward the alveolar line in early infancy. The cases that have come under my notice in which this operation had been performed require a great deal of orthodontic work to correct the deformity caused by this operation. I do not see the necessity for the operation he is performing at present. Other methods are less complicated and give just as satisfactory results in the average case. The operation which Dr. Brown has published lately is to all intents and purposes the one discovered by Diffenbach in 1847, and revived by Sir William Fergusson in 1874. Sir William said that he discovered that this operation had been performed by Diffenbach, after he had completed what he thought was his new discovery.

The classifications of cleft palate are divided into those described by Dr. Jobson. This is all very well, but I realize more fully now than I did a few years ago that the type of cleft is not the vital factor. The important factor is the length of the palate. Some of the worst failures in speech occurred where there was a simple division of the soft palate. This has been reiterated over and over again in the literature of cleft palate, but has apparently not been generally appreciated. Studying the failures as well as the successes, I have now come to judge the palates not on the extent of the cleft but on the length of the soft palate, and on the distance between the posterior wall of the pharynx and the soft palate, because in the physiology of speech it is stated over and over again that distinct articulate speech can best be obtained when the person is able to shut off the pharynx from the nasal passages. In studying the reason for these failures one notes time and time again that the shortness of the palate is the factor which must be taken into consideration. If one gets complete closure of the cleft and the palate does not extend to the posterior wall, the patient is worse off than if operation had never been performed for the reason that it is exceedingly difficult for him to wear an obturator after a successful surgical closure. I have seen cases of congenitally soft palate in which there is the same impediment in the speech as in the case of a closed palate that is too short.

For the correction of this, I have been doing what I call the push-back operation. In this technic I divide the hard palate from the one molar region all the way around to the other side, dissecting back the soft tissue from the bone; dividing the hamular process by means of which I allow the superior constrictor muscle to draw the palate structures back and transfer the tensor palati muscle into an accessory elevator. I have had a sufficient number of cases to be able to state that I can obtain improvement in the cases that heretofore were classed as failures. By this operation, I put the superior constrictor and the levator

palati far enough back so that I am able to close the opening from the pharynx into the nose. This has been decidedly worth while in my cases. In one case of congenitally short palate the patient obtained a 90 per cent improvement in her speech. I might add that my results are judged by Dr. E. Twitmyer of the Psychological Clinic of the University of Pennsylvania. In this way, I am in the position of having some one check up on my work. I think this is a fair thing to do.

I would like to bring out the point that operators on cleft palates have only completed about one third of their work in the actual operation. The second part is the regulation of the teeth and the third is speech training. The point I would emphasize is that patients with congenitally short palates can be successfully operated on by the use of the push-back method. One frequently encounters an opening through the hard palate into the nose, but this can be taken care of by a plate. A loss of part of the anterior tip of the flaps sometimes occurs. To avoid this, I sometimes have done a two stage operation. In other cases, it is frequently safe to do the operation in one stage.

I want to congratulate Dr. Jobson on his excellent results, but I cannot see where the Fergusson operation which he performs is any improvement over the Langenbach method. In the cases in which I do not perform the push-back operation, I do the Warren-Langenbach but divide the hamular process to allow the attachment of the superior constrictor to draw backward. This division also transfers the tensor palati into an assistant elevator. This addition to the Langenbach operation has greatly improved the speech results and has diminished the number of cases in which partial union occurs.

Dr. Thomas E. Carmody, Denver: Dr. Dorrance just made the statement that it is easy to close these palates. It is not easy with me, and some of my results are just as Dr. Dorrance says—rotten. Dr. Jobson stated that it is easy to close the anterior portion. I find that that is not easy in all cases. Two patients died as a result of enlarged thymus before I awakened to the fact that roentgenograms must be made every time these patients come into the hospital. I made roentgenograms in some of the cases early, and thought that that was enough to last for several months. One patient died because of that. Now, if they stay out of the hospital a month, or if I fail to operate on them for a month, roentgenograms are again made to find out whether the thymus is enlarged.

Recently I had a case in which the thymus decreased in size after treatment had been administered. Within three months I found that it was larger than it was before, and treatment was instituted again. Just what the treatment does, I do not know.

Another point that to my knowledge, has not been covered by any of the writings on the thymus is the fact that many of these children have considerable trouble with their digestive apparatus after the treatment of the thymus and sometimes fail to retain their food for two or three days after treatment. Whether that is due to overtreatment, I do not know. I believe it is due to the roentgen ray.

Dr. Jobson spoke about the use of mercurochrome on these incisions. I have always used it. It gives me better results than anything else. I have not used a dressing on the lips in these cases for a number of years. I use a somewhat different method than he does in my packing to keep my periosteal flaps apart. I simply use a packing and retain it by packing it in tightly; I then place a piece of adhesive plaster on the forehead so that it will be noted that there is a packing in place. I have not done Dr. Dorrance's operation. In three cases, I have used a portion of the tongue, in cases of palates that I could not close. I

used one side of the tongue, stitched into one side of the palate, and later cut that flap off and put it into the other side. I was successful in two cases, although I had a great deal of trouble with one.

Dr. George B. Jobson, Franklin, Pa.: Dr. Dorrance's procedure in operation on the cleft palate is commendable as shown by his high percentage of cures. However, I prefer Dr. Brown's method in which none of the palatal muscles are severed; consequently, the soft palate is made to function as perfectly as possible. With reference to Dr. Carmody's statement that he has difficulty in closure of the anterior part of the palate, in the bone flap operation the segments are approximated so closely that it is easy to complete the anterior part of the operation later.

Clinical Notes

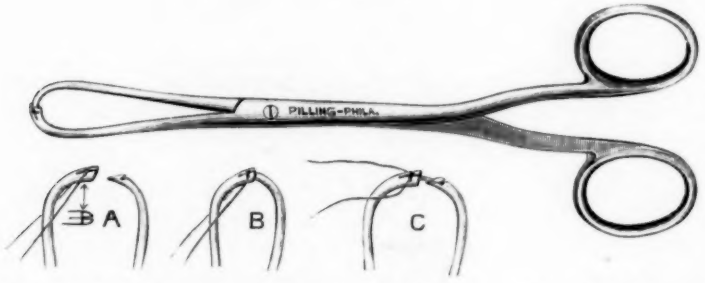
AN INSTRUMENT FOR PLACING SUTURES IN TONSILLAR FOSSAE AND IN OTHER DEEP CAVITIES*

BENJAMIN H. SHUSTER, M.D., PHILADELPHIA

The purpose of the instrument is to place sutures, with ease, in various points of the tonsillar fossae to control hemorrhage after enucleation or in case of secondary hemorrhage.

The principle is not a new one, but the shape and construction of the instrument make it applicable to its purpose. A notched needle pierced through the tissues meets a loop of catgut conveniently placed, and when the needle is withdrawn it pulls a loop of catgut with it. The latter is then tied.

The instrument is shaped and curved like a large Kelly hemostat, the hemostatic portion being substituted by the sewing end of the instrument.



Instrument for placing sutures in tonsillar fossae and in other deep cavities.

The catch is done away with. The sewing portion is shaped like the ordinary towel clip, one end being the needle and the other end a hollow tube into which the needle enters to meet the catgut. Two notches are made in the tube, one for the purpose of inserting the catgut and the other for releasing the catgut after it has been pulled through the tissues. The notches are perpendicular to each other. The end of the tube tapers to a point so that it may embed itself into the tissues and prevent the slipping of the instrument. To use the instrument, one places a long strand of no. 0 or 00 catgut, well soaked, into the perpendicular notch and holds it taut by the lower fingers. The instrument is then applied about the bleeding point as if it were a hemostat or a tenaculum. When the instrument is opened a loop of thread is pulled through which may be tied either doubly or singly. If the piece of tissue is previously picked up by a hemostat or forceps, the suture is more conveniently applied, although this is not necessary.

The shape of the instrument permits one to apply sutures in the upper or hidden angle of the tonsillar fossa and at the lower one near the tongue

* From the otological service of Dr. Coates, Graduate School of Medicine of the University of Pennsylvania.

with the same ease with which they are applied in the more exposed portions of the fossa.

After the first suture is applied and if the remaining thread is long enough, it may be reapplied at a lower point and may so continue, forming a practically continuous suture.

In local anesthesia, the placing of a suture in this way does not gag the patient any more than the placing of a hemostat; thus, general anesthesia may be avoided in difficult cases when suturing is required for secondary hemorrhage. The ease of application often enables the operator to avoid secondary hemorrhage by ligating suspicious points at the outset.

While the instrument is devised primarily for work with tonsils, its use would suggest itself in other surgical fields in which a deep ligature or suture is required and is placed with difficulty because of a limited amount of working space—as in a deep cavity.

The instrument is made by George P. Pilling & Son Co., Philadelphia.

1717 Pine Street.

THE USE OF SALT PORK TO CONTROL HEMORRHAGE*

LEE M. HURD, M.D., NEW YORK

More than ten years ago, Dr. E. L. Keyes, of New York, told me that he had seen a patient with a severe nasal hemorrhage which could not be controlled by the usual gauze packing. The patient stopped the hemorrhage by placing plugs of salt pork in his nostrils. He said that his mother, who also had suffered from severe bleeding from the nose, had taught him to use it.

Larding pork kept in a saturated solution of sodium chloride is practically sterile. Bacterial culture of a piece removed at random from a jar of pork six months old showed only a few colonies of the hay bacillus.

It is hard to say just what the action of the pork is, since several factors are present, namely, pressure, salt, tissue juices and fat.

Pressure has been used from time immemorial to control bleeding, but the pressure from the pork in the nose is probably not so great as it is when gauze packing is used.

According to Hanzlik,[1] 10 per cent salt solution shortens the clotting time of blood by one half, and the effect lasts sixteen minutes. It may be that the pork only holds salt in contact with the bleeding surface, and, by osmosis, continues to give up salt in small quantities for about one hour, long enough to establish a firm clot. The pork, being greasy, usually slips out spontaneously and does not damage the well formed clot.

Tissue juices of the thromboplastic group may be an important factor, but I have never been convinced that they were of great value. To quote a paragraph from Hanzlik:[1]

"It may be concluded that the group of thromboplastic substances which are said to aid the normal clotting of blood, including kephalin, coagulen, thromboplastin, horse and beef serums, did not beneficially affect local hemorrhage when

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*Read before the Section on Laryngology, Otology and Rhinology at the Seventy-Eighth Annual Session of the American Medical Association, Washington, D. C., May 20, 1927.

1. Hanzlik, Paul J.: J. Pharmacol. & Exper. Therap. **14**:71, 1919.

applied directly to wounds of the dog's foot-pad by irrigation with or without 1 per cent citrate. Systemic (intravenous) administration of these agents also did not produce hemostasis, independent of changes in blood pressure. Indeed, in a recent monograph of this class of substances by Hugh Maclean [2] it is doubted if the lipins (kephalin, etc.) constitute the thromboplastic substance of the tissues."

The ether soluble and insoluble products of pork contain only a faint trace of phosphorus, which is normally present in all fats. This lack of phosphorus excludes the presence of kephalin in larding pork. It is possible that one or both of these products have something to do with the clotting.

Fat is known to prolong, not to hasten, clotting.

PRACTICAL USE

In nasal hemorrhage caused by a malignant condition, systemic diseases and rupture of vessels in the Kisselbach area, a piece of salt pork 1½ inches (4 cm.) long and as large as the particular anterior naris will admit, is pushed into the nose until the outer end is well within the nasal vestibule. Usually I do not use any outside dressing to hold the pork in place, as it will slip out in a few hours and there is no more bleeding. However, I have had it remain in the nose as long as three days and be as clean when removed as it was when introduced.

For secondary postoperative tonsillar hemorrhage, place a small piece of salt pork in a tonsil sponge forceps and hold it gently against the bleeding area with just sufficient pressure to control bleeding. The time necessary to hold it in place is less than the clotting time of the patient. In severe tonsillar hemorrhage, I always tie the bleeding points and do not trust to any kind of clot-forming substance.

Larding pork is cheap, common and easily obtained. It keeps well and is handy to use. It is superior to the usual nasal pack in that it is easier to introduce and it is more comfortable for the patient, whose only complaint is that the salt causes smarting for a few minutes. Pork promptly stops the bleeding, and seems to have the property of preventing recurrence.

ABSTRACT OF DISCUSSION

Dr. Walter A. Wells, Washington, D. C.: It makes a great deal of difference whether one is dealing with a free exposed surface or whether the bleeding occurs in a more or less closed cavity in which the natural conformation greatly facilitates the use of prolonged pressure, which cannot be absolutely excluded as a factor in drawing any conclusions as to the value of any particular styptic. It also makes a great difference, I should say, whether the bleeding happens to be of a venous capillary oozing, whether it comes from small arteries which retract easily, or whether it comes from comparatively large arteries of spurting or pulsating character. In the former case, styptics have a useful place. I have seen Dr. Hurd demonstrate his method of using the larding pork, and there are good grounds for believing that he has a useful measure. It probably depends for its efficacy, although he seems to have a different opinion, on the presence of some of the zymoplastic bodies which exist to a certain extent in all animal tissues and probably here in a little greater concentration than anywhere else. However, Dr. Hurd is convinced that when there is active arterial bleeding, it is necessary to resort to ligation, and I would say that this is especially true

2. Maclean, Hugh: Lecithin and Allied Substances, The Lipins, 1918, p. 179.

if the bleeding happens to be on a free exposed surface, where the use of the prolonged pressure is not an easily available or practical procedure. This is the situation that frequently confronts one following tonsillectomy. In these cases place the ligatures not only in those places which are bleeding freely, but in those which are bleeding slightly. I get great comfort from an instrument which I designed recently. This instrument enables me to place a suture in any part of the tonsil fossa so easily that I am now accustomed to use it as a routine procedure, not only at points at which there is bleeding, but at points at which bleeding is likely to occur, that is, at the usual sites of hemorrhage. This sort of routine measure is the best guarantee against postoperative hemorrhage.

Dr. Coates: When I was an intern at the Pennsylvania Hospital, from 1897 to 1900, there was a bottle of salt pork in the receiving ward. During my first night on accident service, I was inducted by one of the senior residents into the operation of putting salt pork into a bleeding nose. I do not know how or why it acts, but it does stop hemorrhage from the nose when it is put in, not packed tightly, but just put into the nose in strips. I have not used it for many years. I had forgotten all about it, but it is a useful procedure, and I am glad Dr. Hurd has brought it to our attention.

Dr. Hurd: Dr. Coates is the first physician I have met who ever heard or knew anything about this procedure. The patient I mentioned came from the Middle West, where it must have been something of a lay remedy. I have often mentioned it to physicians, but I have never heard of any one who knew anything about it. I have had larding pork placed for three days in a septic sinus to control hemorrhage, and have taken it out as clean as when it was placed there. It does not seem to absorb or to become foul. I do use it for secondary hemorrhage in what is termed parenchymatous oozing. I always tie all primary bleedings at the side at time of operation. Do not misconstrue my statement and think that I try to stop tonsillar hemorrhage with it.

Progress in Otolaryngology

A Summary of the Bibliographic Material Available in the Field of Otolaryngology

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ADVANCEMENT IN THE KNOWLEDGE OF ALLERGY AS RELATED TO OTOLARYNGOLOGY

W. W. DUKE, PH.B., M.D.
KANSAS CITY, MO.

The following review covers literature published from about June, 1916, to October, 1927. The bibliography to July, 1927, is relatively complete—that is, for articles which should interest the otolaryngologist. From July to October, 1927, it is not complete. In a paper of this scope it was not possible to include a review of all of the articles mentioned in the bibliography. I have had to limit myself to articles that were available and that tend to illustrate the trend of opinion concerning allergy during the past year. There have been no radical departures from knowledge reported in the previous reviews. Interesting advances have been made, however, along the lines previously initiated, especially concerning pathogenesis, diagnosis, symptoms and treatment.

PATHOGENESIS

In an address delivered before the Association for the Study of Allergy, Coca called attention to the individuality of what he terms atopic shock organs, which proved to be situated in the conjunctivae, nasal mucous membrane, bronchial mucous membrane, skin and probably elsewhere in man. He pointed out that many of the shock organs can be in an atopic state—that is, susceptible to the reaction of hypersensitiveness without exhibiting clinical symptoms under normal conditions—and that, although atopic reagins may be present in the blood of patients with asthma and hay-fever, many may suffer from only one or the other, or neither, of these complaints. He believed with Anderson and Schloss and with Walzer that undigested antigenic particles constantly gain entrance into the blood stream from the normal gastrointestinal tract and that in many instances these bodies can act as anaphylactic antigens. Therefore, many persons with an atopic heredity are exposed to a given substance without developing a clinical illness caused by that substance. Coca believed that a person may be destined

by inheritance at a certain age in life to begin to show symptoms of hypersensitiveness to a particular substance. This seemed to him to be a logical interpretation of facts as they exist at the present time.

Gay and Chant, studying the passive transfer of hypersensitiveness from patients with hay-fever to normal persons, found that the sensitizing power of the serum of the patient with hay-fever depends on the reagin content of the serum and not on the severity of clinical symptoms. They found further that the sensitizing power of the serum was destroyed by heat at 56 C. for forty minutes and was reduced by standing. They also found that an area in which injection had been made remained sensitive for at least thirty-six days, after which time the area gradually lost its sensitiveness. They found, also, that serum from a patient with hay-fever mixed with the atopen to which the patient was sensitive made a potent substance that would produce large wheals in nonsensitive persons if injected intracutaneously—in fact, it was more potent than the atopen itself in like dilution with physiologic sodium chloride solution. They also made the interesting observation that if sensitizing serum is injected into several areas on each arm the subsequent injection of atopen into one arm produces reaction in both arms. It may be interesting to repeat here the previous results reported by Freeman, who sensitized both the mucous membranes and the skin of normal persons with the blood from patients with hay-fever or asthma and caused a reaction in the sensitized areas by feeding the atopen to which the patient was sensitized—in other words, when the nasal membrane of a normal person was treated with the serum from a person sensitive to egg it would swell, itch and throw out a watery discharge if the treated person ate egg. Lewis and Grant and Walzer confirmed these interesting results.

Clark and Gallagher found that atopic reagins can be neutralized in the normal skin without producing atopic reactions. They concluded that in order to produce reaction, the reagin must come in contact with normal skin cells before it combines with atopen. This is somewhat contrary to the results reported by Walzer, who found that persons who had eaten egg or fish, for example, would show a wheal if the serum from a patient sensitive to egg or fish was injected intracutaneously.

Rackemann and Stevens found that the skin of patients recently infected with echinococcus show local skin sensitiveness to fluid obtained from the cyst. This sensitiveness can be transferred locally to a normal person by an intracutaneous injection of the patient's serum. Similar skin tests can be obtained in patients infected with ascaris by local treatment of the skin with ascaris extract. This sensitiveness can likewise be transferred locally to a normal person by an intracutaneous injection of the patient's serum. In neither instance, however, was it possible to

demonstrate precipitins. The authors believed that skin tests may prove useful in the diagnosis of these and similar diseases.

Dienes and Schoenheit found that if tuberculous guinea-pigs are sensitized to egg white, a second dose given after the usual incubation period does not result in the development of the usual quick, large swelling disappearing in from twenty-four to forty-eight hours, such as occurs in nontuberculous pigs. Instead, they develop a necrotic skin reaction similar to the Arthus phenomenon in rats. Subcutaneous reaction causes extensive necrosis but does not kill the animal. Precipitins are present in large amounts in the blood serum. The same phenomenon was observed after similar treatment with timothy pollen extract. This phenomenon is of interest in connection with the fact that patients of allergic strain have a much greater tendency to recover from tuberculosis than nonatopic persons.

Schilling and Hackenthal observed that the intestines of tuberculous guinea-pigs were sensitive to active extracts of tubercle bacilli. The same condition is found in the intestines of healthy guinea-pigs that have been injected with the serum of tuberculous animals.

Koessler, Lewis and Walker report an extensive study of an excellent method, perhaps the best, of studying bronchial constriction in animals. After demonstrating the adequacy of the method, they found that various filtrates from bacteria obtained from micro-organisms contained in the bronchial secretions, empyema fluid, tonsils and other foci of infection and also filtrates obtained from the growth of other pathogenic organisms, such as pneumococci, streptococci, *B. coli, B. typhosus* and *B. paratyphosus,* contain substances that are capable of causing an elevation of blood pressure and a bronchial constriction, or both, in guinea-pigs. These active substances could not be identified as either histamine or tyramine. The authors believe that bacterial poisons of this type may be involved in the production of certain types of bronchial spasm (asthma) in man and in the production of certain forms of arterial hypertension.

Keyes and Strauser reported interesting results on the inhibition of anaphylactic shock by heparin. Of twenty-four pigeons sensitized to normal sheep serum, twelve were given 1 cc. of a 1 per cent solution of heparin twelve days after the sensitizing dose. These and the control sensitized pigeons were then given a shock dose of 1 cc. of normal sheep serum. Of the twelve sensitized animals that did not receive heparin, all showed multiple shock symptoms. Of the twelve sensitized pigeons that had received heparin, eleven did not show any symptoms of shock. One showed the slightest detectable evidence of shock. The authors attributed this peculiar immunity to shock to the fact that heparin inhibits the formation of fibrin and therefore prevents the formation of fibrin emboli.

Reed and Lamson, performing similar experiments in guinea-pigs, obtained a contrary result and concluded that the mechanism of anaphylactic shock in guinea-pigs is different from that in the pigeon.

Hanzlik, Butt and Stockton, studying the action of the muscles of the crop in anaphylactic shock, found that heparin in doses sufficient to inhibit coagulation of the blood did not prevent general symptoms of shock and the reciprocal action of the muscles of the crop in five anaphylactic pigeons. This denies support to a physical theory of these pheromena by this method.

Lewis gave an interesting summary of experiments in which he showed that when the vessels of the skin are injured in several ways, such as by friction, freezing, burning or by the application of mustard gas or irritation by a mercury vapor lamp, they dilate, giving rise to a more or less edematous surface. When the edema subsides, the vessels are in a peculiar state in that they contract imperfectly to normal stimulants, such as epinephrine or solution of pituitary and in many cases refuse to contract at all. They also are more or less refractory to the effect of the stimulant histamine. Lewis believed that in certain clinical conditions, such as in the weather beaten face, the vessels of the face are in a similar state and for the same reason, refuse to contract under the influence of normal stimuli. These experiments are well worth the attention of the nasorhinologists and may account for certain so-called vasomotor disturbances and edema within the nasal cavity, larynx or trachea.

O'Keefe made an interesting addition to the literature on atopic symptoms occurring as a direct result of the specific action of physical agents, such as light, heat, cold or mechanical irritation. He refers to the work of Krough and of Lewis, who have proved that the capillaries are not simple endothelial tubes that react passively to changes in intracapillary pressure. They are, rather, tubes that have within themselves the capacity of dilation and contraction. Both Krough and Lewis agreed that capillary dilation and permeability can be changed by a number of stimuli, both mechanical, physical and photogenic. Krough believed that increased permeability of the capillary wall can occur as a direct result of dilation of the capillaries, and felt that the interstices between the capillary cells are thereby increased, allowing the passage of large protein molecules into the surrounding tissues. O'Keefe felt that this conception has an important bearing on the intense reactions that I have described, which occur in certain persons as a specific effect of exposure to one or more physical agents. He gave an ingenious explanation, assuming that with dilation of the capillaries protein molecules to which the patient's tissues might be sensitive escape through the capillary wall and reach organs that respond with an atopic reaction. He furthermore believed that if dilation of the capillaries should occur in the intestine,

protein molecules, which are usually excluded from the circulation, might be absorbed; if the patient were sensitive to them, he might respond with the usual atopic reaction. O'Keefe assumed that under normal conditions such proteins would not be absorbed by sensitive persons in sufficient quantity to cause reaction. This explanation—different from several that I have offered—is worthy of serious consideration.

In studying light urticaria (urticaria solaris), William Frei found that by injecting solutions of hematoporphyrin or rose bengal intracutaneously he could so sensitize the skin locally to light that a relatively small exposure to light would cause the appearance of a typical itching wheal with pseudopods. A large variety of dyes and other substances used likewise were less effective or were totally inert. His results obtained with hematoporphyrin were therefore contrary to those obtained by Duke in similar studies in 1923, which difference he attempted to account for through assuming that Duke used solutions of hematoporphyrin which were more dilute than his.

Offergeld stated that the female sex organs have an important influence on the development and course of asthma in a certain percentage of cases. He also said that asthma can modify the action of the genital glands to a certain extent. In one patient, he was able to relieve paroxysms occurring at the menstrual period by the feeding of corpus luteum. Intermenstrual attacks were uninfluenced. He said that it is advisable to interrupt pregnancy when severe asthma develops. Emptying of the uterus in eleven cases improved the condition. He said that abortion and stillbirths are likely to occur spontaneously and that the possibility of injury to the heart and lungs can be used as an argument in favor of interrupting pregnancies early. In the last half of pregnancy, the fetus seems more resistant and tolerates the condition better.

Benard and Joltrain reported a case of asthma in which violent paroxysms would follow an emotional shock.

Ziegler and Elliott reported that in a limited number of patients who had asthma and who did not show evidence of sensitization, the attacks are often brought on by emotional disturbance or psychic stimuli.

Duke stated that in the average atopic person there is a mental and neurologic peculiarity characterized by exaggerated response to impressions that deeply concern the patient. He said that by conversing with parents about their asthmatic child, he can usually predict through which side of the family the heredity originates. The feature on which this depends is an exaggerated response to questions concerning the welfare of the child. In addition to this mental peculiarity, hyperesthesia to one or more of the sensations was also noted in a small number of patients. In some, hyperesthesia to pain was so great as to interfere with the treatment. Others showed hyperesthesia to heat, cold or to scratches.

Frequently, in the so-called nonsensitive cases, attacks of asthma would be precipitated by a change in mental activity—that is, from a state of depression to one of activity, or vice versa. This group showed an interesting similarity to patients who had attacks as a result of exposure to cold or to change from heat to cold, or vice versa. This entire complex seemed a result of overreactibility of one or more groups of cells in the nervous system.

PATHOLOGIC CONDITIONS IN THE NOSE

Mullins stated that abnormal conditions in the nose and the accessory sinuses may be factors in the production of cough, chronic bronchitis, bronchiectasis and bronchial asthma. He mentioned also the interesting case of a physician in whom a paroxysm of asthma could be produced by touching the external auditory canal with a cotton swab. The paroxysm could be relieved by cocainization of the nose. He believed that the reflex stimulation that occasionally produces asthma may be caused by pressure or obstruction in the nose or sinuses.

Coates stated that in persons suffering from asthma, hay-fever or coryza caused by sensitiveness to foreign proteins abnormal conditions in the nose may increase the sensitiveness, thereby rendering methods of desensitization partially or totally ineffective. He said that certain forms of rhinitis and asthma are accepted as caused by abnormal reflexes from nasal pathologic alterations. In these, cure lies in operation on the nose or in treatment. Nasal treatment in cases of this type depends on freeing the nose from any source of infection. In asthma, in which sensitiveness cannot be demonstrated, Coates suggested that a search be made for local sensitive spots that might be responsible for abnormal reflexes. If found, these should be removed. He stated also that proper ventilation and drainage are important as general measures for restoring a patient's health. He finally suggested the possibility of blocking the fifth nerve, or sphenopalatine ganglion. His final and most important conclusion is that the best result can be obtained by the close cooperation between the allergist, internist and rhinologist, not only in diagnosis but also in subsequent treatment.

In making nasal examinations in twenty cases of asthma referred by pediatricians, Lierle found disease of the paranasal sinuses in every case. Chronic suppurative sinusitis was present in nine; hyperplastic ethmoiditis and sphenoiditis, in six; chronic suppurative ethmoiditis, in three, and chronic suppurative maxillary sinusitis, in four. The tonsils were chronically infected in ten. In 60 per cent, deflexion of the septum, which obstructed drainage of the sinuses, was found.

I stated again that polypi can occur as a result of the chronic edema of the nasal membranes caused by allergy—in other words, the edema of allergy can be a cause of polypi in the same sense that the edema

of infection can be a cause of polypi. I found that this was a characteristic of perennial cases rather than of seasonal cases and assumed that in seasonal cases the membranes had an opportunity to regain normality during the period that the patient was well. For this reason, I do not favor surgical treatment unless indicated per se, because of the fact that an operation does not remove the primary cause of the illness.

ETIOLOGY, TESTS AND EXTRACTS

Rackemann recently reported an exhaustive study of 1,074 patients with asthma seen for the first time more than two years ago; he made an effort to give a general survey of their progress during the period in which they were under observation. He presented clear graphic charts that are worthy of study and that could not possibly be summarized in this brief report. His results indicated clearly the fact that the symptom, asthma, is based on a variety of causes and is not a disorder of single etiology. He makes the important observation that a certain percentage of children tend to get well spontaneously. He believed that his observations refute the idea that all cases of asthma depend on a background of hypersensitiveness to some foreign substance. He also stated that positive skin tests are not always a matter of clinical import.

In studying hypersensitiveness in early life, Stuart and Farnham found that in children hypersensitiveness to foods is common as compared with hypersensitiveness to inhaled substances. With age, the latter type of sensitiveness increases and hypersensitiveness to foods, often existent since birth, is inclined to reduce in its intensity or to disappear. They stated that treatment by oral desensitization is preferable to awaiting a natural loss of such hypersensitivity.

Stuart reported a study of 202 cases of asthma. She emphasized the value of repeated skin tests and the use of intradermal methods when cutaneous methods fail to give a positive result. She emphasized feathers as a primary cause of illness in a large percentage of epidermal cases and as a secondary factor in a minority of cases caused by other agents. In a group of 116 cases in which the primary cause of symptoms seemed to be animal emanation, 58 per cent of the patients were relieved for a year or more by the elimination of the offensive substance. Failure to relieve the remaining patients was attributed frequently to the physician's failure to obtain the complete cooperation of the patient.

Nicholson reported the study of skin hypersensitiveness to flax and linen. Knowledge of this is important because of the frequent contact of persons with each of these agents. In spite of the fact that the skin reactions were definite, clinical improvement in the patient did not follow avoidance of flax or linen, nor was treatment with increasing doses of flax successful.

Storm van Leeuwen reported the use of cutaneous tests with extracts of human dandruff. He found that the majority of patients with asthma give a positive test with human dandruff. Keller had previously found that 100 per cent of cases of tardive exudative eczema gave positive tests. Normal persons rarely give a positive test. He thought that the cause of the reactions might be attributed in part to the presence of fungi and bacteria or their products. Since the reaction occurs so frequently in allergic patients, Keller considered it useful in deciding whether or not a person has an allergic tendency.

Rowe reported an interesting survey made in the San Francisco district in which counts made from pollen plates were compared with a study of the flora of different districts around San Francisco. He found the most important pollen of the area was a grass, *Lolium perenne*. *Poa annua* pollinated throughout the entire year, most abundantly in January, February and March and in October and November. Pollen of the ambrosia, artemisia, chenopod, plantain and rumex groups was rare. Rowe remonstrated that a small amount of pollen could be the cause of clinical symptoms.

After making a botanical survey of Oklahoma and comparing the abundance of various plants with the results of clinical tests in patients, Balyeat emphasized the importance of the acnidas in that district. He found that this was not only abundant in its growth, but also that it pollinated profusely; in fact, he stated that it pollinates at least 500 times more profusely than the amaranths. For this reason, he believed that in case a patient is sensitive to both the acnida and the amaranth, the former is the more important cause of illness.

After a complete study of skin tests, Chandler reported that group testing is efficient if the solutions employed are not too weak. He cautioned against placing too much dependence on skin tests and suggested the cautious study of a case.

Bernton, Jones and Csonka reported a study in which an effort was made to separate the different protein fractions extracted from pollen, and the effect of these noted when used separately in diagnosis and treatment. They frequently found patients sensitive to one faction and not to the others, and frequently to more than one faction. They believed that greater success in the prophylaxis and treatment of hayfever may attend the use of the particular protein to which the patients may react.

Stier reported an important study of different extractives used in the making of pollen solutions. He worked with several modifications of Clock's solution and Coca's solution, and studied the effect of buffers. He concluded that an unbuffered solution containing sodium chloride, 7 per cent, and glycerine, 46 per cent, met the requirements of a pollen

extractive most successfully, and would remain sterile and effective for as long as three and one-half years.

In studying the nature of allergens, Klewitz and Wiegand subjected extracts of cattle hair and of grass pollen to various physical and chemical tests. They found that allergens are heat-fast and that they are not precipitated by ammonium sulphate saturated with calcium. They are apparently precipitated by the ammonium salt alone. They are easily dialyzable. They are quantitatively absorbed by animal charcoal and less so by kaolin and aluminum hydroxide. They are soluble in physiologic sodium chloride solution but are not soluble in alcohol, ether, chloroform or acetone. They are biuret-negative substances. Klewitz and Wiegand considered allergens to be low molecular substances not belonging to the lipoids. They considered it possible that they are protein substances or products of proteolysis. The presence of nitrogen in allergens could not be positively established. They considered that allergens are probably not of uniform nature.

Grove and Coca previously called attention to the fact that ragweed pollen extract may be freed from the protein content and yet remain active as determined by skin tests in sensitive persons. Black found that allergens so denatured by digestion as to give negative protein tests and negative complement fixation tests continue to have their symptom-producing power when used in testing sensitive persons. He used a protein-free extract in treating a large number of persons one year with as good a result as was obtained with the extracts ordinarily used. He stated that the active substance in pollen does not depend on its protein content and that standardization of an extract, according to nitrogen content or by a complement fixation, does not give one a certain idea of its content in active substance.

SYMPTOMS

After a study of 100 consecutive cases of epilepsy, Spangler stated that he believed that the immediate cause of convulsions in certain idiopathic cases is a reaction of hypersensitiveness. His clinical study is based on the finding of a family history of the disease, allergy, the existence of other allergic phenomena in the patient and on the result of treatment.

Eosinophilia has long been recognized as a manifestation of the allergy reaction. Brown studied this in some detail, making differential counts on 346 patients with asthma or some allied condition. He found that the eosinophilia bore little relationship to either age or sex. He found an average eosinophilia of 7 per cent in patients with asthma whether they belonged to the group that could be proved hypersensitive or to the apparently nonsensitive type. In marked contrast, an eosinophilia of only 2 per cent was found in asthmatic cases that were

examples of bronchitis. He also found about the same average in nasal cases in which the reaction was seasonal (eosinophilia, 5.5 per cent) or perennial (eosinophilia, 7 per cent). There is no difference in the percentage in the hypersensitive type of cases and in the apparently nonsensitive type. The eosinophilia found in patients with ordinary colds in the head was only 3 per cent. In patients with eczema of the hypersensitive type, the eosinophilia averaged 6.5 per cent. In eczema of the apparently nonsensitive type, the eosinophils averaged 4.5 per cent. In urticaria an average eosinophilia of 4 per cent was found. Brown found little difference between nonsensitive patients and patients who were sensitive to foods (eosinophilia, 7 per cent). Patients who were sensitive to epidermal substances had an eosinophilia of 6 per cent, and those sensitive to pollen, 6.5 per cent. Brown found that the number of eosinophils in the sputum varied directly with the number found in the blood. He did not find a relationship between the blood calcium and the eosinophilia.

Vaughan stated that whereas allergy is not the sole cause of eczema, he believed that it is the commonest cause that has been recognized so far. He mentioned the fact that a person sensitive to certain substances does not always necessarily react on contact with the substance. He explained the failure of these reactions to appear by assuming that the person comes in contact occasionally with a second substance to which he is sensitive and that the two together give rise to a reaction in which either one alone might cause trouble. He also said that, in a person on the point of reacting, eczema may appear under the influence of some additional nonspecific cause, such as mechanical irritation, endocrine disturbance, infection or an illness occurring as the result of the absorption of some other toxic substance. In discussing treatment, he mentioned the advisability of avoidance not only of the specific cause of the illness but also of the contributory causes and nonspecific causes. He also discussed methods of diagnosis and of specific and symptomatic treatment.

Wynn reported generalized pruritus due to specific hypersensitiveness occurring in patients without other physical manifestations of the disease and patients who do not give a personal or family history of atophic hypersensitiveness.

After a total of 523 experiments, Ratner, Jackson and Gruehl stated that fifty-three, or 10.1 per cent, of the animals with anaphylaxis showed ocular symptoms. The symptoms were usually suffusion of a thin watery fluid, rapidly becoming thick and creamy. In some cases, the eyelids were matted together. This condition lasted for half an hour or more. It was observed more frequently (15.3 per cent) in animals in which the reaction was brought about by exposure to the dust of the material with which they were sensitized. It occurred less frequently (in 8.3 per

cent) in animals in which the material was injected parenterally. The authors believe that vernal conjunctivitis may have some relationship to anaphylaxis.

TREATMENT

Dust-Free Air.—Progress has been made not only in treatment but also in diagnosis through the use of air rendered free of organized elements, such as pollen and hair. This principle has been made use of for years by patients who change their environment to avoid substances to which they react. The same result can be accomplished, to a degree, by having patients remain in a closed room in which the air is quiet. Under this circumstance, organized material usually sinks to the floor and leaves the air relatively pure. In a room in which the doors and windows were kept closed for several weeks, I found that a pollen count was constantly less than 1/1000 of that of the outside air.

Several types of apparatus have been described for the purpose of filtering air as it enters a room, thus keeping the room fresh and cool. This has been accomplished best through the use of a fan forcing air through a filter which is either wet with some material such as glycerin, or one which is dry, with pores fine enough to catch small particles of dust and pollen. This principle works admirably, even though the room is not air-tight, because the fan forcing filtered air into the room at the same time forces air out through any small openings that may exist, thereby preventing the ingress of dust-laden air from the outside. A filter of this sort is of proved usefulness. Pollen plates exposed in a room equipped with a filter may show the air to be practically free of pollen even though it is abundant on the outside — in fact, pollen may be sprinkled directly in front of the fan and may not appear on pollen plates exposed in the room. Cohen emphasized the value of such procedures and described a filter that is useful not only in the treatment of patients with hay-fever and asthma, but also in diagnosis. He said that patients who regain health in a dust-free room are probably sensitive to some air-borne substance, whereas those who retain their symptoms for a considerable period are no doubt sensitive to some substance not derived from the air. He stated that considerable relief can be obtained in the treatment of patients by this means.

Pollen.—Progress in treatment with pollens during the past year has been largely an elaboration of methods previously used.

Specific treatment, especially with pollens, is spoken of generally with increased optimism, although as a rule, authors recognize that the success of treatment and methods of treatment should depend largely on the district in which the patients reside and on the type of sensitiveness.

Brown reported an interesting deviation in the treatment of pollen disease through the use of pollen extract given throughout the year at

intervals of one month or less. In 1916, a similar method was reported before the American Association for the Study of Allergy in Dallas by Dr. Stewart. According to Brown's method, the patient is given ascending doses of pollen extract according to the outline usually used in preseasonal treatment. When the maximum dose is reached, the time interval is gradually lengthened to two, three and four weeks and is continued at the latter interval indefinitely — that is, for several years. The results obtained in a number of patients treated in this way were as good as those obtained by the usual preseasonal treatment. Two persons under such treatment remained free from symptoms for five seasons, one for four seasons, four for three seasons, four through two seasons and three through one season, with satisfactory results. In no instance did a patient receiving annual treatment fare worse than one receiving preseasonal treatment. Cooke repeated this work in fifty cases, reporting satisfactory results in forty-five. In only nine were the results not as good as they had been with preseasonal treatment. In several instances, the time interval had to be shortened because of a tendency toward reaction. The reactions, however, were neither more frequent nor more severe than those which usually occur with pollen treatments as ordinarily used.

Kahn also discussed the annual method, stating that by giving submaximal doses of pollen at long intervals throughout the year a considerable degree of immunity can be maintained and quickly increased just prior to the beginning of the pollen season. This method should be especially useful, he stated, in districts in which the pollen season of a certain grass, such as Bermuda grass, extends throughout the greater portion of the year.

Black presented a study of a revival of a previously used method of treatment through the administration of pollen extract by mouth. He stated that he himself was sensitive to ragweed and took well diluted pollen extract before meals, in ascending doses by mouth, reaching a final quantity of 2.5 cc. of 1 : 20 glycerin Coca extract three times a day. Previous to treatment, 0.1 cc. of a 1 : 10,000 dilution of pollen extract produced sneezing when injected into the nostrils. After treatment, a similar amount of a 1 : 1,250 dilution was required to produce the same symptom.

Black said that this method of treatment did not produce any untoward results and that blood withdrawn from the vein showed the presence of ragweed pollen on injection into a person who is sensitive to pollen. It was shown also that the ragweed reagin of his blood was not completely neutralized, since the serum could still passively sensitize a normal skin. He drew the important conclusions that pollen administered by mouth had no ill effect: that it could be absorbed from the

alimentary tract, that it could be demonstrated in the blood stream, and that it greatly diminished the sensitivity of the nasal mucous membrane to pollen.

Sterling, reporting on desensitization, found that it is a successful method for the relief of asthma. He stated, however, that the result is not permanent and is unsuccessful in about 15 per cent of hypersensitive cases because of grave complications such as inflammatory change in the respiratory system, cardiorenal disease and deficiency in the glands of internal secretion or tuberculosis.

In reviewing the results of specific treatment, Vaughan found that success depends chiefly on the treatment of all interacting factors. He did not find any relationship between a good therapeutic result and the intensity of skin tests, age or duration of the disease. He believed that results were a little better, however, in patients who did not give a family history of the disease.

In comparing pollen hay-fever in children with that in adults, Kahn found that for children, doses of desensitizing pollen were practically the same as those for adults. He found that high temperature occasionally accompanies asthmatic paroxysms in children and gives rise to a condition that can easily be mistaken for pneumonia. Treatment consists in the use of epinephrine and protection from the pollen. He found that injudicious overdosage with pollen extract often gives rise to high fever in children. He found, furthermore, that pollen in childhood can cause a chronic annoying cough, toxemia and nasal blockage with mucoid discharge, which could easily be overlooked as occurring as a result of hypersensitiveness. He found purulent sinusitus an unusual complication. Skin tests were less frequently positive than in adults, and the children were more easily relieved by being kept indoors during the height of the pollen season.

After a study of 300 cases of bronchial asthma, Menagh stated that his treatment depended largely on the discovery of the causative agent and its removal. He reported that 28.3 per cent became symptom-free by removal of the cause; 27.7 per cent were improved, and only 12.7 per cent remained unimproved.

Ephedrine.—Further studies concerning the usefulness of ephedrine tend to confirm the more conservative views previously held, namely, that ephedrine has an action similar to epinephrine though less pronounced and more prolonged, that it is useful in many cases of asthma, and that frequently it can be used best in conjunction with epinephrine. It can be used as a spray and for its general effect by mouth.

Chen, Meek, Kao and Schmidt reported extensive studies on the pharmacology of ephedrine and its isomeres. They stated that it is closely related to epinephrine both chemically and physiologically, and that, while less active physiologically than epinephrine, it has an advan-

tage over epinephrine in therapy because it is able to elicit a more prolonged effect and because of it is more stable and capable of absorption when taken by mouth. They thought that it will prove useful as a local application in the nose in case of chronic congestion and hay-fever and in the treatment of patients who have bronchial asthma. They recommend it also for patients who have anaphylaxis or urticaria and for those who are poisoned by narcotic drugs. They believed that it should also be useful as an aid in ophthalmoscopic examinations. They stated that there are other alkaloids isomeric with ephedrine which may differ from it physiologically. One may look forward to a careful study of these substances in the hope that some of them may prove superior to ephedrine.

Balyeat also found that after using ephedrine in the treatment of more than 100 cases of asthma, it proved valuable in about 65 per cent of the cases. He considered the drug nontoxic and nonhabit-forming, but found that in about 20 per cent of the cases it produced unpleasant symptoms, such as nervousness, wakefulness, urinary frequency and tremor to the extent that it could not be used successfully. He found it of little practical value in the treatment of patients with hay-fever, except in conjunction with pollen therapy.

After a careful study, Garde and Maytum reported that ephedrine given in doses of from 25 to 60 mg. affords temporary relief to more than 50 per cent of patients with autumnal hay-fever. In an additional 25 per cent, sufficient relief is obtained to warrant its use. A 3 per cent solution used as a nasal spray gives relief of short duration which seems gratifying to the patient. Occasionally, untoward effects are noticed, such as tremor, tachycardia, palpitation, weakness, faintness, sleeplessness or nausea.

Miscellaneous Treatment.—Leas found that in a certain percentage of patients with asthma the vital capacity may be increased by having them breathe dry air. He thought that this therapeutic test should prove useful in deciding whether or not a patient would be benefited by going to a dry climate.

Sterling gave a conservative report concerning the effectiveness of operation on the nose in relieving patients with asthma and with "vasomotor disturbances" in the nose. He stated that in addition to surgical intervention, measures should be taken to desensitize the patient and improve the general health.

Hesse reported the surgical removal of the sympathetic nerve in seventeen patients. The majority of the operations were failures; less than 30 per cent of the patients could be called cured twenty-one months after operation.

McBroom reported five cases of asthma; in each case the patient was relieved by transfusion of blood.

I treated two patients with asthma by transfusion because of high grade anemia; in one case, the treatment was a dire emergency. Both cases almost terminated fatally within a few minutes in allergic shock. In one case, the illness followed the injection of the first syringe of blood. Each shock was attributed to sensitiveness on the part of the patient to a food eaten by the donor. The result was such as to leave no doubt in my mind as to the grave danger attending transfusion in cases of hay-fever or asthma. It seems too dangerous an operation to justify extensive usage.

Lowenstein stated that psychotherapy is of value in about two thirds of all cases of asthma.

BIBLIOGRAPHY

Alexander, H. L.; Luten, D., and Kountz, W. B.: Effects on Heart of Long Standing Bronchial Asthma, J. A. M. A. **88**:882 (March 19) 1927.

Alexander, H. L.; Holmes, J. A., and Becke, W. G.: Smooth Muscle in Anaphylactic Guinea-Pigs. Exaggerated Response to Mixtures of Sensitized Tissue and Homologous Antigens, J. Immunol. **12**:401 (Nov.) 1926.

Auday, I., and Arana, E. L.: Case of Asthma of Malarial Origin, Semana méd. **1**:1214 (June 3) 1926.

Baldwin, L. B.: Routine Skin Tests in Chronic Nephritis, J. Lab. & Clin. Med. **12**:1 (Oct.) 1926.

Some Observations of the Skin and Mucous Membrane Reactions in Hay-Fever, J. Immunol. **13**:345 (May) 1927.

Ball, F. E.: Heredity Migraine; Its Treatment with Peptone and Its Familial Relation to Sensitization Diseases, Am. J. M. Sc. **173**:781 (June) 1927.

Balyeat, Ray M.: Methods of Testing Hay-Fever and Asthma Patients for Protein Sensitivity and the Selection of Correct Proteins for Treatment, J. Oklahoma M. A. **19**:215 (Aug.) 1926.

Clinical Use of Ephedrine in the Treatment of Asthma and Hay-Fever, J. Oklahoma M. A. **20**:3 (Jan.) 1927.

Hay-Fever and Asthma. Factors Which Determine the Pollen Content of the Air, J. Lab. & Clin. med. **12**:1151, 1927.

Benard, R., and Joltrain, E.: Case of Asthma of Emotional Origin; Emotion and Hemoclastic Shock, Bull. et mém. Soc. méd. d. hôp. de Paris **50**:1155 (July 2) 1926; abstr. J. A. M. A. **87**:977 (Sept. 18) 1926.

Bernton, H. S.: Pollenosis, Wisconsin M. J. **26**:242 (May) 1927.

Bernton, H. S.; Jones, B., and Csonka, F. A.: Pollen Proteins and Their Clinical Significance in Hay-Fever. A Preliminary Communication, South. M. J. **20**:257 (April) 1927.

Biberstein, H.: Passive Transfer of Hypersensitiveness to Chemically Known Substances, Ztschr. f. Immunitätsforsch. u. exper. Therap. **48**:297, 1926.

Bircher, Willy: Experimenteller Beitrag zur Frage des Primelekzems, Dermat. Ztschr., vol. 45.

Black, J. H.: Pollen Therapy with Protein-Free Extracts, J. A. M. A. **86**:324 (Jan. 30) 1926.

Treatment of Hay-Fever Through Administration of Pollen Solutions by Mouth, J. Lab. & Clin. Med. **12**:1156 (Sept.) 1927.

Bloch, B.: Ueber Berufsdermatosen mit spezieller Berucksichtigung des berufsekzems, Schweiz. med. Wchnschr. **55**:89 (Jan. 29) 1925.
Ekzem und diathese, Ztschr. f. klin. Med. **99**:3, 1923.

Bolschakova, M.: Roentgenotherapy; Good Results in Eighteen Cases, Ann. de roentgenol. et radiol. **2**:240, 1927.

Brown, Aaron: A New Plan for Applying the Specific Treatment of Pollen Hay-Fever (Perennial Treatment). Preliminary Report, J. Immunol. **13**: 273 (April) 1927.

Brown, G. T.: Eosinophilia in Asthma, Hay-Fever and Allied Conditions, J. Lab. & Clin. Med. **12**:1145 (Sept.) 1927.
History Taking in Bronchial Asthma, J. A. M. A. **88**:1693 (May 28) 1927.
Late Spring or Summer Hay-Fever in the District of Columbia and Vicinity, J. Lab. & Clin. Med., 1927.
Multiple Sensitization in Bronchial Asthma. Report of Cases, Ann. Clin. Med. **5**:893 (March) 1927.

Bryce, A.: Anaphylaxis and Ultra-Violet Light Treatment, Brit. M. J. **1**:509 (March 19) 1927.

Campbell, G. A.: Allergic Diseases of Childhood, Canad. M. A. J. **16**:1070 (Sept.) 1926.

Chandler, F. C.: Skin Tests, Asthma and Idiosyncrasy, Lancet **208**:1177 (June 6) 1925.

Chen, K. K., and Meek, W. J.: A Comparative Study of Ephedrine, Tyramine and Epinephrine with Special Reference to the Circulation, J. Pharmacol. & Exper. Therap. **28**:31 (July) 1926.

Chen, K. K., and Kao, C. H.: Ephedrine and Pseudoephedrine. Their Isolation, Constitution, Isomerism, Properties, Derivatives and Synthesis, J. Am. Pharm. A., August, 1926, vol. 15.

Chen, K. K., and Schmidt, C. F.: The Action and Clinical Use of Ephedrine, J. A. M. A. **87**:836 (Sept. 11) 1926.

Chen, K. K.: A Comparative Study of Ephedrine, Pseudo-Ephedrine and Phenyl-Ethylamine, Arch. Int. Med. **39**:404 (March) 1927.

Clarke, J. A., Jr., and Gallagher, May G.: Neutralization of Atopic Reagins in Vivo, J. Immunol. **12**:461 (Dec.) 1926.

Coates, G. M.: Rhinologic Aspects of Allergy, Ann. Otol. Rhin. & Laryng. **35**: 723 (Sept.) 1926.

Coca, A. F.: Food Poisoning with Special Reference to Food Idiosyncrasy (Hypersensitiveness), Dietary Admin. & Therap. **5**:35 (Feb.) 1927; J. Lab. & Clin. Med. **12**:1135 (Sept.) 1927.

Cohen, M. B.: A Pollen Filter, M. J. & Record **123**:322 (March) 1926.
The Prophylaxis and Treatment of Hay-Fever and Asthma in Rooms Made Pollen and Dust Free by Means of Mechanical Filters, J. Lab. & Clin. Med. **12**:59 (Oct.) 1928.

Coke, F.: Review of One Thousand Cases of Asthma, Brit. M. J. **1**:955 (May 28) 1927.

Debre, R. L., and Baudry, C.: Rheumatoid Purpura, Serum Sickness and Anaphylaxis, Paris méd. **1**:566 (June 12) 1926; abstr. J. A. M. A. **87**:365 (July 31) 1926.

De Eds, F.: Thrombocyte and Erythrocyte Changes During Anaphylactic Shock in Pigeons, J. Pharmacol. & Exper. Therap. **28**:451 (Sept.) 1926.

Dienes, L., and Schoenheit, E. W.: Local Hypersensitiveness: I. Sensitization of Tuberculous Guinea-Pigs with Eggwhite and Timothy Pollen, J. Immunol. **14**:9 (July) 1927.

Local Hypersensitiveness: II. The Transfer of Local Hypersensitiveness of Tuberculous Guinea-Pigs with the Blood Serum, J. Immunol. **14**:43 (July) 1927.

Local Hypersensitiveness: III. Hypersensitiveness of Guinea-Pigs Treated with Egg White During Smallpox Vaccination, J. Immunol. **14**:53 (July) 1927.

Local Hypersensitiveness: IV. General Considerations, J. Immunol. **14**:61 (July) 1927.

Doerr, R.: Hypersensitiveness and Hyposensitiveness, Arch. f. Dermat. u. Syph. **150**:509, 1926; abstr. J. A. M. A. **87**:1342 (Oct. 16) 1926.

Die Idiosynkrasien, Handbuch der Inneren Medizin, Berlin, 1926.

Ueber Allergie und allergische Hauterkrankungen, Arch. f. Dermat. u. Syph., 1926, vol. 151.

Doerr, R., and Bleyer, L.: Latent Period of Passive Anaphylaxis in Guinea-Pigs, Ztschr. f. Hyg. u. Infectionskrankh. **106**:371, 1926.

Doerr and Hallauer: Kritische und experimentelle Untersuchungen über die Antigenfunktionen der zell-lipoide, Schweiz. med. Wchnschr. **55**:962 (Oct. 15) 1925.

Ueber die Antigenfunktionen des forssmanschen Lipoids und anderer lipoider Haptene, Ztschr. f. Immunitätsforsch. u. exper. Therap. **47**:291, 1926.

Anaphylactic Antibody and Its Relationship to Proteins and to Other Antibody Functions of Immune Sera, Ztschr. f. Immunitätsforsch. u. exper. Therap. **47**:363, 1926.

Dujardin, B., and De Camps, N.: Rôle of Anaphylaxis in Pathogenesis of Dermatoses, Ann. de dermat. et syph. **7**:629 (Nov.) 1926.

Duke, W. W.: Physical Allergy, J. A. M. A. **84**:736 (March 7) 1925.

Advancement in Our Knowledge of Allergy as Related to Otolaryngology During the Past Two Years, Arch. Otolaryng. **4**:430 (Nov.) 1926.

Mental and Neurologic Reactions of the Asthma Patient, J. Lab. & Clin. Med. **13**:20 (Oct.) 1927.

Fineman, A. H.: Studies in Hypersensitiveness: XXV. A Study of the Degree of Sensitivity of Asthmatics to Various Atopens, J. Immunol. **12**:191 (Sept.) 1926.

Foerster, O. H.: Cutaneous Manifestations of Allergy, Wisconsin M. J. **26**:237 (May) 1927.

Freeman, John: Proc. Roy. Soc. Med. (Laryngol. Section) **18**:29, 1925.

Frei, William: Versuche zu urticariellen Lichtreaktion, Arch. f. Dermat. u Syph., 1926, vol. 151.

Frugoni-Ancona: L'asma bronchiale, Turin, 1927.

Gaarde, F. W., and Maytum, C. K.: Treatment of Hay-Fever with Ephedrine: Preliminary Report, Am. J. M. Sc. **172**:588 (Oct.) 1926.

Gahringer, John Edward: The Sensitization of Pigeons to Foreign Proteins, J. Immunol. **12**:477 (Dec.) 1926.

Galjart, J. S.: Coryza Nervosa: Report of Two Cases of Hypersensitiveness to Feathers, Acta oto-laryng. **9**:525, 1926.

Gay, L. N., and Chant, E.: Passive Transfer of Hypersensitivity (Local and Contralateral Passive Transfer Experiments), Bull. Johns Hopkins Hosp. **40**:270 (May) 1927.

Gins, H. A.: Vaccinal Allergy of Guinea-Pigs and Its Practical Use, Ztschr. f. Hyg. u. Infektionskrankh. **106:** 213 (June 24) 1926.

Gohs, W.: New Theory of Bacteriophage Action and Its Relation to Immunity, Anaphylaxis and Digestion; Theory of Anaphylaxis, Ztschr. f. Immunitätsforsch. u. exper. Therap. **47:**1, 1926; abstr. J. A. M. A. **87:** 533 (Aug. 14) 1926.

Grove, Ella F.: Studies in Specific Hypersensitiveness: XXVI. On Asthma and Dermatitis Due to Hypersensitiveness, to Pediculoides Ventricosus, J. Immunol. **12:**263 (Oct.) 1926.

Hajos, K.: Inhibition of Anaphylactic Shock by X-Rays, Ztschr. f. d. ges. exper. Med. **53:**597, 1926.

Passive Anaphylaxis, Klin. Wchnschr. **5:**1330 (July 16) 1926.

Hanzlik, P. J., and Stockton, A. B.: Reactions of the Circular Muscle of the Crop During Anaphylactic Shock in Pigeons, J. Immunol. **13:**395 (June) 1927.

Haseltine, Burton: The Economic Factor in Asthma, Am. Med. **20:**599 (Oct.) 1925.

The Allergist and the Rhinologist, J. Ophthalmol. Otol. & Laryng., May, 1926.

Hektoen, Ludvig: Observations with Precipitin Reaction, J. Immunol. **14:**1 (July) 1927.

Hesse, E.: Do Results Justify Sympathectomy in Bronchial Asthma? Deutsche med. Wchnschr. **52:**870 (May 21) 1926; abstr. J. A. M. A. **87:**287 (July 24) 1926.

Hettwer, J. P., and Kriz-Hettwer, R.: Further Observations on Absorption of Undigested Protein, Am. J. Physiol. **78:**136 (Sept.) 1926.

Hutchison, R.: Asthma in Childhood, Brit. M. J. **1:**783 (April 30) 1927.

Hyde, Roscoe R.: Heterologous Corpuscular Anaphylaxis, J. Immunol. **12:**309 (Oct.) 1926.

Jadassohn, W.: Experiments in Case of Idiosyncrasy Against Egg, Schweiz. med. Wchnschr. **56:**667 (July 10) 1926; abstr. J. A. M. A. **87:**980 (Sept. 18) 1926.

Beitrage zum Idiosynkrasieproblem, Klin. Wchnschr. **5:**1957 (Oct. 15) 1926.

Experimentelle untersuchungen bei einem Fall von Idiosynkrasie gegen Huhnerel, Schweiz. med. Wchnschr. **57:**46, 1926.

Jadassohn and Zaruski: Idiosynkrasie gegen sellerie, Arch. f. Dermat. u. Syph., 1926, vol. 151.

Jaeger, M. H.: De la nature de l'eczema. Recherches experimentales. Hypersensibilité, idiosyncrasie et anaphylaxie cutanées chez les eczemateux, Ann. d. dermat. et syph., 1923, vol. 4.

Jungeblut, C. W., and Berlot, J. A.: Rôle of Reticulo-Endothelial System in Immunity; Production of Active and Passive Anaphylaxis in Blocked Animal, J. Exper. Med. **44:**129 (July) 1926.

Kahn, I. S.: Pollen Toxemia in Children, J. A. M. A. **88:**241 (Jan. 22) 1927.

Subcutaneous Emphysema in Case of Bronchial Asthma, J. A. M. A. **88:**1883 (June 11) 1927.

Essential Differences in Chronic Pollen Hay-Fever and Asthma in Adults and in Children, J. Lab. & Clin. Med. **12:**1197 (Sept.) 1927.

A Practical Method of Maintaining Medical Pollen Immunity, J. Lab. & Clin. Med. **13:**77 (Sept.) 1927.

Nasal Pathology and its Relation to Bronchial Asthma, Texas State J. Med. **23:**36 (May) 1927.

Kern, R. A.: Causes of Failures in Hay-Fever Treatment, M. Clin. N. Amer. **10**:47 (July) 1926.

Klauder, J. V.: Pruritus as Symptom of Vagatonia, Atlantic M. J. **30**:163 (Dec.) 1926.

Klauder, J. V., and Brown, H.: Experimental Studies in Eczema, Arch. Dermat. & Syph. **15**:1 (Jan.) 1927.

Klecki, C., and Pelczar, C.: Rôle of Blood Platelets in Anaphylactic Shock, J. de physiol. et de path. gén. **24**:285 (April) 1926; abstr. J. A. M. A. **87**:1517 (Oct. 30) 1926.

Klewitz, F., and Wiegand, R.: The Nature of the Allergens, Klin. Wchnschr. **6**:1432 (July 23) 1927.

Klopstock, A.: Anaphylaxis Against Lipoids, Ztschr. f. Immunitätsforsch. u. exper. Therap. **48**:97, 1926.

Koessler, K. K.; Lewis, J. H., and Walker, J. A.: Pharmacodynamic Actions of Bacterial Poisons, Arch. Int. Med. **39**:163 (Feb.) 1927.

Kolmer, J. A.: Nature of Hay-Fever and Bronchial Asthma, Ann. Otol. Rhin. & Laryng. **35**:758 (Sept.) 1926.

Kummell, H.: Operative Treatment of Bronchial Asthma, Arch. f. klin. Chir. **142**:499, 1926.

Keyes, Preston; and Strauser, E. R.: Heparin Inhibition of Anaphylacitic Shock, J. Immunol. **12**:419 (Nov.) 1926.

Leas, R. D.: Vital Capacity; Study of Effect of Breathing Dry Air, Arch. Int. Med. **39**:475 (April) 1927.

Lehner, E., and Rajka, E.: Transmission of Supersensibility of Human Skin to Rabbit's Ear, Ztschr. f. d. ges. exper. Med. **52**:855, 1927.

Lewis, Thomas: Vascular Reactions of the Skin to Injury, Heart **13**:1 (Sept.) 1926.

The Blood Vessels of the Human Skin and Their Responses, London, Shaw and Sons, 1927.

Lewis, Thomas; and Love, W. S.: Vascular Reactions of the Skin to Injury, Heart **13**:27 (Aug.) 1926.

Lewis, Thomas; and Grant, R.: Heart **13**:219 (Sept.) 1926.

Lierle, D. M.: Paranasal Sinus Disease and Asthma in Young Children, Ann. Otol. Rhin. & Laryng. **35**:544 (June) 1926.

Lischkoff, M. A., and Fellows, J. H.: Bronchial Asthma and Its Relation to Sinus Disease in Children, J. Florida M. A. **13**:200 (March) 1927.

Lowenstein, J.: Psychotherapy of Asthma, Med. Klin. **22**:994 (June 25) 1926; abstr. J. A. M. A. **87**:797 (Sept. 4) 1926.

Lumiere, A.: Value of Anaphylaxis Theory Based on Functional Alteration of Organic Sensibility, Presse méd. **34**:1105 (Sept. 1) 1926; abstr. J. A. M. A. **87**:1517 (Oct. 30) 1926.

McBroom, W. T.: Blood Transfusion in Treatment of Bronchial Asthma, Canad. M. A. J. **17**:426 (April) 1927.

Manges, W. F., and Hawley, S. J.: Roentgen-Ray Findings in Chests of Asthma Patients, South. M. J. **20**:126 (Feb.) 1927.

Manwaring, W. H.: The Basic Concepts of Immunity, J. Immunol. **12**:174 (Sept.) 1926.

Manwaring, W. H.; Marino, H. D.; McCleave, T. C., and Boone, T. H.: Relation of Anaphylaxis to Immunity: III. Specificity of the Fixed-Tissue Anti-anaphylatoxic Immunity Factor, J. Immunol. **13**:319 (May) 1927.

Relation of Anaphylaxis to Immunity: IV. Normal and Anaphylactic Detoxication of Specific Foreign Proteins, J. Immunol. **13**:357 (May) 1927

Manwaring, W. H.; Marino, H. D., and Boone, T. H.: Erythrocyte Anaphylaxis in Dogs, Proc. Soc. Exper. Biol. & Med. **24**:651 (April) 1927.

Mautner, H.: Pathologic Conditions of Infants Attributed to Anaphylaxis; Their Treatment, Wien. klin. Wchnschr. **39**:872 (July 22) 1926.

Menagh, Frank R.: The Results of Treatment in Bronchial Asthma, Ann. Clin. Med. **5**:656 (Jan.) 1927.

Meyersburg, H.: Influence of Filtered Quartz Light on Nasal Ganglion; Preliminary Report, Arch. Otolaryng. **4**:415 (May) 1927.

Moldovan, I., and Slavoaca, T.: Nature of Desensitizing Principle After Injection of India Ink, Compt. rend. Soc. de biol. **94**:1305 (May 28) 1926.

Müller, E. F.: Ueber eine gemeinsame vegetative Steuerung von Haut und Lebergebiet, München med. Wchnschr. **73**:1349 (Aug. 14) 1926.

Müller, E. F.; Myers, C. N., and Peterson, W. F.: Nature of Shock Symptoms Occasionally Following Drugs or Vaccines, J. A. M. A. **88**:1128 (April 9) 1927.

Mullin, W. V.: Rhinological Aspect of Bronchial Asthma, Radiology **8**:482 (June) 1927.

Nicholson, D.: Cutaneous Reactions to Flax and Linen in Five Cases of Bronchial Asthma and Two of Hay-Fever, with Poor Results from Specific Treatment, Canad. M. A. J. **17**:552 (May) 1927.

Offergeld, H.: Female Sexual Life and Asthma in Their Reciprocal Influence, Ztschr. f. Geburtsh. u. Gynäk. **90**:22, 1926; abstr. J. A. M. A. **87**:1079 (Sept. 25) 1926.

O'Keefe, E. S.: The Influence of the Capillary Circulation Upon Certain Allergic Conditions, J. Lab. & Clin. Med. **12**:1149 (Sept.) 1927.

Pagniez, P., and Escalier, A.: Tolerance for Prolonged Epinephrine Treatment in Certain Subjects with Asthma, Bull. et. mém. Soc. méd. d. hôp. de Paris **50**:619 (April 23) 1926; abstr. J. A. M. A. **86**:1948 (June 19) 1926.

Peshkin, M. M.: Asthma in Children; Incidence and Significance of Eczema, Urticaria and Angioneurotic Edema, Am. J. Dis. Child. **32**:862 (Dec.) 1926.

Pick, E.: Idiosyncrasy of Skin and Nervous System, Dermat. Wchnschr. **82**:573 (April 24) 1926.

Piness, G., and Miller, H.: Cutaneous Manifestations of Protein Allergy, Arch. Dermat. & Syph. **14**:144 (Aug.) 1926.

Pratt, J. H.: Cardiac Asthma, J. A. M. A. **87**:809 (Sept. 11) 1926.

Rackemann, F. M., and King, D. S.: Bronchial Asthma, Boston M. & S. J. **195**: 347 (Aug.) 1926.

Rackemann, F. M.: Studies in Asthma: 1. A Clinical Survey of 1,074 Patients with Asthma Followed for Two Years, J. Lab. & Clin. Med. **12**:1185 (Sept.) 1927.

Rackemann, F. M., and Stevens, Amos H.: Skin Tests to Extracts of Echinococcus and Ascaris, J. Immunol. **13**:389 (June) 1927.

Ramirez, M. A., and St. George, A. V.: Incidence of Syphilis in Bronchial Asthma, Am. J. Syph. **11**:59 (Jan.) 1927.

Ramsdell, Susan G.: A Study of Pollen Immune Serum, J. Immunol. **12**:231 (Sept.) 1926; The Smooth Muscle Reaction in the Serum Treated Earthworm, J. Immunol. **13**:385 (June) 1927.

Ratner, B.: Jackson, H. C., and Gruehl, H. L.: Ocular Manifestations in Anaphylaxis, Proc. Soc. Exper. Biol. & Med. **24**:444 (Feb.) 1927.

Reed, C. I., and Lamson, R. W.: The Influence of Heparin on the Course of Anaphylaxis in the Guinea-Pig, J. Immunol. **13**:433 (June) 1927.

Rowe, A. H.: House Dust in Etiology of Bronchial Asthma and of Hay-Fever, Arch. Int. Med. **39**:498 (April) 1927.

Rowe, A. W.: Pollen Counts in the East Bay District of San Francisco Bay Throughout the Year, with Studies of the Morphology of Pollen, J. Lab. & Clin. Med., 1927.

Samson, I. W.: Beitrage zur Kenntnis der Uberempfindlichkeit, Wchnschr. f. Pract. Arzte, 1926.

Schiff, N. S.: Proper Management of Allergic Phenomena, with Special Reference to Non-Specific Therapy in Bronchial Asthma and Hay-Fever, Ann. Clin. Med. **5**:374 (Oct.) 1926.

Schilling, C., and Hackenthal, H.: Passive Transmission of Hypersensitiveness in Tuberculosis of Man and Animals, Deutsche med. Wchnschr. **52**:1373 (Aug. 13) 1926; abstr. J. A. M. A. **87**:1521 (Oct. 30) 1926.

Schuster, J.: Influencing Mental Diseases by Production of Severe Anaphylactic Shock, Arch. f. Psychiat. **77**:314, 1926.

Scott, S. G.: Method of Treating Asthma by Radiation: Preliminary Note, Brit. M. J. **1**:939 (June 5) 1926.

Shapiro, P. F., and Ivy, A. C.: Gastric Ulcer; Experimental Production of Gastric Ulcer by Local Anaphylaxis, Arch. Int. Med. **38**:237 (Aug.) 1926.

Sokolow, A. S.: Further Observations on Treatment of Skin Processes in Exudative Diathesis, München. med. Wchnschr. **73**:945 (June 4) 1926; abstr. J. A. M. A. **87**:373 (July 31) 1926.

Spangler, R. H.: Allergy and Epilepsy. Analysis of 100 Cases, J. Lab. & Clin. Med. **13**:41 (Oct.) 1927.

Sterling, Alexander: Desensitization and Its Difficulties, Ann. Clin. Med. **5**:536 (Dec.) 1926.

Relation of Asthma to Nose and Throat Surgery, M. J. & Record **125**:336 (March 2) 1927.

The Relation of Asthma to Nose and Throat Surgery, M. J. & Record **125**:336 (March 2) 1927.

Stewart, Zella W.: Treatment of Asthmatic Patients Affected by Protein of the Epidermal Group, J. Lab. & Clin. Med. **12**:1179 (Sept.) 1927.

Stier, R. F. E., and Hollister, Guy: Pollen Antigens as Determined by the Skin Reaction, J. Lab. & Clin. Med. **12**:1139 (Sept.) 1927.

Van Leeuwen, W. Storm; Bien, Z., and Varekamp, H.: Cutaneous Reaction with Extracts of Human Dandruff in Allergic Illnesses, Klin. Wchnschr. **5**:1023 (June 4) 1926.

Significance of Climatic Influences in Bronchial Asthma and Other Allergic Diseases, Schweiz. med. Wchnschr. **56**:705 (July 24) 1926.

Significance of Skin Tests for Diagnosis and Treatment of Allergic Diseases, Klin. Wchnschr. **5**:1525 (Aug. 13) 1926.

Strauss, E. B.: Psychogenic Asthma, Lancet **1**:962 (May 7) 1927.

Stuart, H. C., and Farnham, M.: Acquisition and Loss of Hypersensitiveness in Early Life, Am. J. Dis. Child. **32**:341 (Sept.) 1926.

Tucker, G.: Bronchoscopy in Disease; Bronchial Asthma, M. Clin. N. Amer. **10**:123 (July) 1926.

Urbach, E.: Hypersensitiveness of Skin to Physical Injuries, Wein. med. Wchnschr. **77**:192 (Feb. 5) 1927.

Urbach, E., and Steiner, M.: Mechanical Anaphylaxis from Barley Dust; Case, Wien. klin. Wchnschr. **40**:188 (Feb. 10) 1927.

Vallery, P.; Radot, P.; Blamoutier and others: Local Passive Anaphylaxis; Control for Cutireaction, Compt. rend. Soc. de biol. **95**:1196 (Nov. 19) 1926.

Vaughan, W. T.: A Study of Eczema as an Allergic Phenomenon, South. M. J. **17**:749 (Oct.) 1924.

The Interaction of Specific and Nonspecific Factors in Allergic Disease, Virginia M. Monthly **51**:472 (Nov.) 1924.

Sensitization Disease: An Evaluation of the Results of Specific Treatment, Southern Med. & Surg., July, 1926.

Allergic Eczema, J. Lab. & Clin. Med. **12**:1213 (Sept.) 1927.

Walker, E. R. C.: Anaphylaxis Following Administration of Serum, Brit. M. J. **1**:1084 (June 26) 1926.

Walzer, M.: J. Immunol. **4**:249, 1926.

Williams, O. B., and Van de Carr, F. R.: Effect of Heparin on Anaphylactic Shock in Guinea-Pigs, Proc. Soc. Exper. Biol. & Med. **24**:798 (May) 1927.

Ziegler, L. H., and Elliott, D. C.: Effect of Emotion on Certain Cases of Asthma, Am. J. M. Sc. **172**:860 (Dec.) 1926.

Zinsser, H.: Hypersensitiveness, Boston M. & S. J. **196**:387 (March 10) 1927.

Abstracts from Current Literature

Ear

SEEING SOUND: THE USE AND VALUE OF THE OSISO IN THE SCIENTIFIC STUDY OF SPEECH AND THE ACCURATE GRAPHING OF SPEECH VIBRATION. By MAX A. GOLDSTEIN, Laryngoscope **37**:551 (Aug.) 1927.

The study of the mechanism of speech dates back to ancient times, but only within the last hundred years have attempts been made to record the waves of motion produced by the voice as speech curves.

In 1856, Leon Scott of Paris invented the phone autograph. This consisted of a large funnel-shaped mouthpiece leading to a thin elastic membrane equipped with a revolving cylinder coated with smoke. The manometric flame of Rudolf Konig was a modification of this in which the change of pressure in a lighted gas burner projected against the membrane manifested itself as a change in the size of the flame.

Alexander Graham Bell, inventor of the telephone, an expert in speech and a teacher of the deaf, and Clarence J. Blake, distinguished aurist of Boston, modified these devices by using the human temporal bone with the tympanum, malleus and incus intact, and with a stile of hay substituted for the stapes. This produced good graphs.

Electricity heralded a new era in the study of speech graphs. Edward Scripture used the phonograph of Edison and the gramophone of Berliner; however, it was impossible to obtain accurate graphs for many of the delicate and sensitive speech graphs produced by various consonant elements. In 1924, Dr. Irving B. Crandall and C. F. Sacis, of the research department of the Bell Telephone Laboratories, described modern methods whereby with the adaptation of the oscillograph highly accurate speech waves were secured.

In January, 1927, Joseph W. Legg, research engineer of the Westinghouse Electric and Manufacturing Company, announced the invention of the osiso, a portable and modified form of oscillograph, by means of which the study of the speech elements was so simplified that another important link in the chain of these investigations was forged. On hearing of this invention, in an appeal to E. M. Herr, president of the Westinghouse Electric and Manufacturing Company, to provide an osiso for the Central Institute for the Deaf, in St. Louis, the author summed up his first impression of the device as follows:

"I recognize in the practical application of the osiso, many possibilities for speech wave instruction for the deaf child. He will be shown the appearance of a properly made speech element and encouraged to control his voice to produce the same wave. Faulty tone or voice production will be connected as pupil and teacher see together the actual moving voice picture. Oral training of the deaf child will be placed on a more accurate scientific basis and he will acquire a better form and quality of speech."

The purpose of presentation in this case was to offer a preliminary report on the research work which has been undertaken at Central Institute for the Deaf with the instrument which Legg personally installed there.

The work consists of (1) the development of a new phonetic record of osisograms of all vowel and consonant elements; (2) the preparation of phonetic textbooks for the education of the deaf child by this system; (3) the study of the pathology of speech as recorded by speech graphs in defective phonation; (4) the instruction of the deaf child to correct his own speech as made possible by the actual visualization of his defective speech graph simultaneously with the model speech graph of the teacher, and (5) the more accurate analysis of qualitative and quantitative phonetics as presented by sensitive osisograms.

The first procedure has been directed toward the production of a model graph of every vowel and consonant element of speech. For this purpose a group of trained speech teachers, both male and female has been selected. Individual graphs of their several speech elements have been made, and the osisograms have been compared for quality and intensity. Composite osisograms have also been produced to develop standards.

The practical objective in the use of the osiso will be to familiarize the eye of the deaf child with the model osisograms that represent the elements of sound and speech. These forms should be impressed on the active brain of the child as readily as the symbols of the alphabet, or as the phonetic symbols of shorthand, and it should be possible to teach the phonetics of speech to the deaf child as readily as to teach him reading or writing by the usual symbols of the alphabet. Finally, the visual reception of speech as a rapid motion picture should offer no greater handicap to the deaf child than his normal ability to read rapidly the text of a printed page.

SNAPP, Grand Rapids.

THE GRAPHIC METHOD OF TEACHING DEAF-MUTES. E. W. SCRIPTURE, Ztschr. f. Hals-, Nasen- u. Ohrenh. **19**:27 (May 16) 1927.

When a totally deaf child, who has never learned to speak, enters school in order to learn how to speak, its organs of voice production are normal, as a rule, and it would be able to use its voice like other people if it would know how. The speech of such a child is frequently faulty. The graphic method, first worked out by Abbé Rousselot, can be used to correct many mistakes of the pupil. The author published his first results in the *Volta Review* in 1913. The person talks into a mouthpiece. The motion of the air and of the sound waves is carried through a wide tube to a membrane made of oiled silk. The movements of the membrane are magnified by a lever and registered on the surface, which is covered with soot. First the child speaks into the apparatus, and then the teacher does so for comparison. The method should be used from the start, so that the child will learn the correct enunciation. It is much better to prevent a faulty enunciation than to be obliged to correct it later. According to the experiences of Freunthaller, it is important to begin the teaching of speech at the age of 3 years.

TECHNIC OF NEUMANN'S LABYRINTH OPERATION. OSCAR BECK and EMIL SCHLANDER, Ztschr. f. Hals-, Nasen- u. Ohrenh. **19**:59 (May 16) 1927.

An exact and detailed description of Neumann's operation on the labyrinth is not available; therefore, the authors undertook the task to furnish one. A comparison of the technic of that operation with that of others is also not obtainable. The demand always to reach the inner meatus is not an essential point in Neumann's operation. This procedure is dependent on well defined indications. Anatomic conditions govern the choice between two types of operations. One of the factors is the distance of the sinus sigmoideus from the posterior wall of the canal, specifically, the twisting of the pyramid around its long axis, whereby the sinus more or less approaches the posterior wall. Besides, the level of the sinus must be considered, namely, as: (*a*) A protruding sinus situated mostly superficially, and (*b*) a protruding sinus at a normal level. The size of Trautmann's triangle (outlined by the spur of the facial nerve, the sinus and the middle cranial fossa) determines the choice of technic. The more superficially the sinus is situated and the more a superficially situated sinus protrudes, the more difficult it is to guide the chisel, because the chisel must be placed more vertically and steeper, the higher the sinus is situated and the more it protrudes. The details of the methods must be read in the original. Numerous illustrations accompany the article. Only a few items may be mentioned at random. Precise indications are furnished by clinical symptoms in connection with observations during the operation.

If a broad fistula is encountered, leading from the semicircular canal toward the vestibulum, the vestibulum and the sagittal semicircular canal are opened under the guidance of a probe. In necrosis, the line of demarcation or the extension of the necrosis determines the path of operation. If the oval window is empty and the promontory is decayed and full of granulations, it is dangerous to use the chisel in the cochlea. The diseased wall of the promontory is

Choice of Procedures

	Cochlea	Excitability of the Vestibulary Apparatus	Fistula	Spontaneous Nystagmus	Operation
I	+	+	+	+	Not indicated
				—	Not indicated
II	—	+	+	+	Eventually*
				—	Not indicated
III	+	—	+	+	Indicated
				—	Eventually
IV	+	—	—	+	Eventually
				—	Eventually
V	—	—	+	+	Indicated
				—	Indicated
VI	—	—	—	+	Indicated
				—	Eventually
VII	—	+	—	+	Not indicated
				—	Not indicated

* "Eventually" means (explained by Dr. Oscar Beck) that the operation on the labyrinth may become necessary at a later date, namely, when the rests of function of the inner ear, present at the first operation, are lost, and, furthermore, under certain conditions, i. e., if the function of the vestibulary apparatus is lost after the radical operation.

lifted with the sharp spoon. In uncomplicated cases of suppurative labyrinthitis, neither the dura of the middle cranial fossa nor that of the posterior cranial fossa is laid bare. The authors dwell on the methods used in meningitis of labyrinthine origin, in the opening of the inner meatus in meningitis by way of the cochlea and in the operation on the labyrinth in abscess of the cerebellum, also on the technic used in removing the edge of the pyramid.

A bayonet-shaped chisel, used by Neumann, is depicted.

AMBERG, Detroit.

THE INFLUENCE OF LIGHT ON VESTIBULARY TURNING NYSTAGMUS AND AFTER-NYSTAGMUS. THIRD COMMUNICATION. I. OHM, Ztschr. f. Hals,- Nasen- u. Ohrenh. **19**:87 (Aug. 27) 1927.

1. In the light, an opticovestibulary nystagmus shows itself during slow turning. Strange to say, it is pendulum-like in some people and stops immediately after turning. When it is absolutely dark, however, a jerking nystagmus of a small amplitude occurs during turning. After turning, an after-nystagmus of long duration occurs toward the opposite side. The author comes to the conclusion that, besides the pendulum-like vestibulary after-nystagmus, in the light, a jerking nystagmus of large amplitude and low frequency occurs in some people. In view of the circumstance that the patients were mentally inferior, it seems possible that a large amplitude and low frequency depend on an inferiority of the brain.

Years ago, the author studied the nystagmus of miners and concluded that the oculomotor apparatus functioned more perfectly in a greater frequency and a smaller amplitude.

2. A third patient had a disease of the left ear with difficulty in hearing and attacks of dizziness. In all instances in which a disease of the ear is suspected the tests should be made repeatedly in extreme darkness. The author considers nystagmus to the left in the dark a vestibulary symptom. It was not

constant, and changed to a nystagmus to the right, which however, was not pure. The "counterstrokes" seemed to appear when the vestibulary irritation was not particularly strong or was dying out, as occurs in the after-nystagmus in the dark. This latent tendency, in the light, toward spontaneous nystagmus leads to disturbances of the vestibulary turning nystagmus and after-nystagmus. In addition, the fourth case furnished an example of the value of nystagmography in the dark.

3. Besides nystagmography, optic turning nystagmus should be included in the methods of examination of the vestibulary apparatus. The inversion of the spontaneous nystagmus discovered by Bárány and Brunner cannot be cited as a proof of its nonlabyrinthine origin. Disturbances of the optic turning nystagmus must be expected in diseases of the ventrocaudal Deiter's nucleus in which the descending visual rays terminate. The author thinks it possible that diseases of the peripheral vestibulary system may also lead to disturbances of the optic turning nystagmus through alteration of Deiter's nucleus. The author hopes that otologists will make use of nystagmography in the dark in addition to the optic turning nystagmus. In many obscure cases, when the patients complain of difficulty in hearing and dizziness, undisputed objective symptoms may probably present themselves. A regular nystagmus cannot be simulated. In 1918, the author suggested that vestibulary tests be made under different illuminations, because his experience with other types of nystagmus taught him that they yielded different results in the light and in the dark. He also thought it probable that labyrinthine tests (turning, caloric, galvanic) would give different results in the light and in the dark. In 1926, the author proved his contention concerning the fistula symptom, and now, in three instances, he has proved it concerning the turning nystagmus. Ohm does not doubt that his observations hold good also for the caloric and galvanic nystagmus, but he has not yet proved this by tracings. AMBERG. Detroit.

Larynx

THE EXPECTANT TREATMENT OF DIPHTHERITIC LARYNGEAL STENOSIS. E. BURGHARD, Monatschr. f. Kinderh. **31**:627, 1926.

The author points out the importance of differentiating between the laryngeal stenosis of grip and that of diphtheria, and in the latter condition of determining the presence or absence of involvement of the lower airway. He makes the following differential points. Pathologically, the process in grip is a hyperemia of the small vessels and capillaries, together with edema and the absence of exudative processes; in diphtheria the membrane is the important finding. In diphtheria the laryngeal stenosis, cough, aphonia, vomiting, fetor, membrane, stridor and urobilinogenuria are significant, while in grip a general catarrh of the mucous membrane and high fever are found.

The course of the disease is helpful in establishing the diagnosis. If the serum does not have any effect on the clinical course, the process is usually grip, or a descending diphtheria. An irregular temperature curve and the gradual appearance of suffocation are indicative of grip, while a gradually descending temperature curve, persisting stridor and attacks of sudden suffocation point to a diagnosis of diphtheria. In passing, the author mentions as causes of dyspnea in infancy and childhood, measles, syphilis, foreign body, congenital stridor, tumor, retropharyngeal abscess, angioneurotic edema, urticaria, hysteria and pemphigus.

It is important in cases of diphtheria to establish the presence or absence of involvement of the bronchi. This complication is to be considered when the disease has been present from five to fourteen days before admission to the hospital, with persistent attacks of suffocation, when there is evidence of impairment of the cardiovascular system, as indicated by pallor, cold perspiration, soft irregular pulse and low blood pressure and when the dyspnea is not relieved by the coughing up of membrane. A cloudy sensorium, the

presence of slight aphonia, with marked dyspnea, and the presence of albuminuria suggest a specific infection. A fatal termination may be anticipated when improvement does not take place within twenty-four hours after the use of serum, and when increasing apathy, caused by poisoning from carbonic acid, makes its appearance.

The author describes the expectant treatment, the purpose of which is to delay tracheotomy as long as possible. Serum is given early in massive doses, intramuscularly and intravenously. The liberal use of narcotics throughout the course of the disease is a cardinal point in this form of treatment because of the necessity of controlling the fear of asphyxia in the patient. The author states that there is not any danger that the continued narcosis will prevent the coughing up of loosened membrane. In the production of the narcosis the writer uses narcophin, adalin, chloral hydrate and codeine if the cough is bad.

It is important to support the circulation, and to accomplish this, cardiazol, and hexeton intramuscularly, digalen, strychnine, strophanthin in severe cases and lobeline intramuscularly when the weakness involves also the respiratory system are given. Inhalations of oxygen do not seem to be of much avail.

General treatment involves the placing of the patient absolutely at rest in a quiet, well ventilated room, in a bed near the open window. The child must be allowed to assume whatever position it desires, experience having shown that a patient will naturally adopt the one which most facilitates the breathing. His every wish must be gratified to prevent restlessness and mental disturbance. One must be prepared for immediate tracheotomy at any time. The only local treatment is the occasional aspiration of loosened membrane; the use of sprays and vapors of epinephrine hydrochloride is of no avail.

The patients must be constantly watched, often by the continued personal attendance of the physician in charge in order to anticipate a respiratory crisis. This condition is indicated by complete, sudden cessation of breathing, unconsciousness, limp paralysis and involuntary urination. Tracheotomy is always indicated in suffocation caused by an undescending diphtheria. It should be performed in case of suffocation occurring within the first twenty-four hours after the injection of serum, because one does not always know at that time whether the suffocation is caused by grip or diphtheria, and if the latter, whether or not the obstruction is confined to the larynx or has involved the bronchi. The author finds his principal indications for tracheotomy in cases of laryngeal diphtheria in which the stenosis is caused by mechanical closure of the larynx, and cases in which there is some doubt as to the descending character of the disease.

Tracheotomy is delayed until the child does not recover immediately from an attack of suffocation, grave cyanosis becomes prominent, the child becomes unconscious or cessation of breathing appears. The advantage in so doing is that tracheotomy is avoided in many cases; this is desirable on account of the high mortality of the procedure in infants, and because anesthesia is not necessary if it must be performed.

The author feels that tracheotomy is contraindicated in slight and medium cases and in those complicated by descending infection and by pneumonia.

The author concludes his article by pointing out that such treatment is possible only in special clinics, and that it involves a watchful waiting on the part of the attending physician, which causes much strain.

CONNOR, St. Paul.

Nose

TRAUMATIC PHLEBITIS OF THE LATERAL SINUS. P. CORNET, Ann. d. mal. del' oreille du larynx **46**:549 (June) 1927.

Only thrombophlebitis of the lateral sinus due to accidental injury to the sinus during mastoid operation was considered. While it is thought by most authorities that serious complications under these conditions are rather the exception than the rule, the author regards this accident as one to be feared

and treated with great respect. The danger does not lie so much in the opening of the sinus but in the fact that the wound lies in a more or less septic field and the subsequent infection leads to grave consequences.

A great number of these accidents to the sinus can be traced to the fact that the location of the sinus is variable. This is especially true when the sinus lies well forward, superficially at times, masking the antrum. In such a situation the sinus will likely be entered by the gouge at the very beginning of the operation. On the other hand, many daring surgeons believe that it is safer to lay the sinus bare in the process of the operation, although the danger of the injury to the sinus wall is increased.

The appearance of the symptoms of sinus complication may not be constant, but it is usually the general condition of the patient that attracts attention. Chills and rapid intermittent rises in temperature cause the surgeon to direct his attention to the sinus.

The treatment is as much preventive as possible, since it is known that there is an accidental or intentional insult to the sinus. No matter when the sinus is injured the operation should be completed and all of the disease process removed. As small a tampon as possible may be placed in the sinus to control hemorrhage, and the remainder of the sinus should be packed. Many times it is of value to place a small amount of packing between the sinus and the mastoid cavity proper. The blood picture as well as the blood culture should be watched carefully during the succeeding days. Ligature of the internal jugular vein should not be delayed when the diagnosis of sinus thrombophlebitis has been established.

ROENTGEN-RAY EXAMINATIONS IN OZENA. G. FERRERI and L. PAROLA, Arch. internat de laryngol. otol. rhinol. **6**:769 (July-Aug.) 1927.

The various theories and treatments of ozena seem to be contradictory and at variance with each other. Some authorities believe that ozena originates as a primary infection and by recurrences finally invades the periosteum and bone. Others believe that it concerns the bone originally. Others maintain that it is a disease of the sinuses and their osseous walls, and that the nasal condition is secondary. Among the English, ozena is ascribed chiefly to syphilis and tuberculosis, but the authors contend that few syphilitic and tuberculous patients are found among the large mass of patients with ozena and that the occurrence of these diseases is coincidental. Antisyphilitic treatment is of little value in a large majority of ozenas.

Lautenschlager sectioned the heads of thirty children, who succumbed to acute infectious diseases, and noted the lesions of the nose and accessory sinuses. He believes that ozena has a definite relation to the acute diseases of the sinuses in childhood. The authors, while admitting his theory as the most plausible, believe that many other conditions display a number of the characteristics he emphasized.

The parasitic theory, particularly that of Perez, is discussed at length, but does not seem acceptable because the condition cannot be reproduced experimentally, and vaccines do not seem entirely specific.

The therapeutics of ozena has not been satisfactory and, in fact, almost suggests charlatanism. The authors do not object to cleansing methods and means of disguising the odors. They do not condemn physiotherapy and simple means of narrowing the nasal passages, but they cannot subscribe to extensive operative procedures in the nose that neither cure nor relieve ozena.

A radiologic study was made of 100 patients from 15 to 35 years of age with ozena. The usual intranasal conditions of ozena were found. Study of the sinus resulted in the following statistics:

Maxillary sinus: increase of transparency, 7; unilateral decrease of transparency, 3; arrest of development, 3; normal, 64. Ethmoid sinuses: rarefaction, 46; unilateral decrease of transparency, 2; normal, 46. Frontal sinuses:

increase of transparency, 14; enlarged sinus, 16; arrest of development, 36; normal, 19. Sphenoids: transparency increased, 6; transparency diminished, 2; enlarged sinus, 2; normal, 90.

The conclusions reached were that ozena is not of sinus origin, but that the sinuses are secondarily affected or involved by conditions foreign to ozena. If the condition were of sinus origin it should have more effect on the remainder of the respiratory tract and the ears.

Sodium Salicylate in Ozena. Dutheillet de La Mothe, Arch. internat. de laryngol. otol. rhinol. **6**:794 (July-Aug.) 1927.

The author apologized for presenting such a short and recent series, but wished to call attention to a means of treatment in a disease otherwise resistant.

A young man had been treated by the author for many years for a definitely and particularly stubborn ozena. The patient presented himself one day following an interval in which he had been treated for acute articular rheumatism with cardiac complications. The principal treatment consisted of sodium salicylate. The nasal condition was vastly improved, so much so that the fossae appeared practically normal.

The author then treated eight patients, five women and three men, with sodium salicylate in doses of 4 Gm. internally, each day. There was no improvement in three cases, improvement in three cases and what practically amounted to a cure in two cases.

The author suggested that a treatment might be tried, consisting of the injection of serums obtained from patients who were convalescing from acute articular rheumatism.

Ozena and Infectious Scleroma of the Respiratory Passages. Francesco Lasagna, Arch. internat de laryngol. otol. rhinol. **6**:798 (July-Aug.) 1927.

While scleroma of the upper respiratory passages is considered relatively rare, the author finds that it is not uncommon in northern Italy. In his treatments he employs galvanocautery, the roentgen ray, radium, curettage, tracheotomy, autogenous vaccine and neoarsphenamine. He found that galvanocautery gave the best results and that the roentgen ray had little effect, despite frequent applications. Radium arrested the process as long as it was confined to the nose.

Sixteen cases of scleroma were presented, five of which were fatal. Two cases followed definitely established ozena, and attention was called to the fact that ozena may favorably prepare the field for the subsequent scleroma.

The conclusions were that the bacillus of Frisch is found in all cases of scleroma, that the bacillus can produce scleroma in the experimental animal and that the methods of Bail do not immunize against scleroma.

Experimental Ozena. J. Rebattu and H. Proby, Arch. internat. de laryngol. otol. rhinol. **6**:804 (July-Aug.) 1927.

If ozena is of purely microbic origin the disease should be capable of being reproduced experimentally. Such experiments have not been successful. Researchers aided by war injuries have been able to demonstrate atrophic changes in the nose by sphenopalatine resections and injuries to the gasserian ganglion. Worms and Reverchon apparently were the first to attract attention to this particular feature in the etiology of ozena.

The authors reported a case of an injury to the left side of the head with fragments of bone in the pterygoid maxillary fossa. Eighteen months later, a true ozena had developed on the same side. The only organism found was the staphylococcus.

The authors believe that treatment of the ozena should comprise, aside from the usual intensive vaccine therapy and local treatment of the nose, a course of intelligent endocrine and sympathetic neurologic treatment .

RESULTS OF SYMPATHECTOMY AS A TREATMENT OF OZENA. EDOUARD CASTERAN, Arch. internat. de laryngol. otol. rhinol. **6**:810 (July-Aug.) 1927.

The essays on the etiology and pathogenesis of ozena are followed by novel theories, and new methods of treatment are in vogue for a time. Following the work of Reverchon and Worms, Bergis and Asteriades reports appeared of the complete cure of ozena by the resection of the sympathetic nerve after the method of Leriche.

The author reports three cases in detail, in which the ozena was attacked by resection of the carotid plexus according to the method of Leriche. Improvement, amounting practically to a cure, followed for a short time, and then the condition gradually returned to its original status.

The conclusions reached by the essayist were that the operation proposed by Leriche is not complete and is impractical, because the total extirpation of the carotid plexus is impossible, no matter how careful the surgeon may be, and that either a regeneration of the plexus or an anastomosis is established within a month after the operation. He believes that the only chance of success in the operation on the sympathetic nerve lies in an approach to the superior cervical sympathetic nerve.

OSTEITIS FIBROSA OF RECKLINGHAUSEN OF THE ETHMOIDOSPHENOID. E. V. SEGUAR and H. ZUBIZARRETA, Arch. internat. de laryngol. otol. rhinol. **6**:816 (July-Aug.) 1927.

The literature on the etiology and pathology of the disease was reviewed in detail. The authors presented a patient aged 36, who at the age of 17 complained of nasal stenosis. At that time, the surgeon performed a double turbinectomy. Gradually, the root of the nose, left maxilla and orbital wall became involved. When seen by the authors the deformity was marked. Rhinoscopy showed a dense tumor mass obstructing the left side. Operation was performed after the technic of Moure. Radical extirpation was effected, and the postoperative results were satisfactory.

The authors are of the opinion that extensive and radical surgery is imperative, but that in the generalized form of the disease only palliative measures are of any value.

ROTH, Kankakee, Ill.

ATROPHIC RHINITIS AND THE NASAL ACCESSORY SINUSES. A. LAUTENSCHLAEGER, Ztschr. f. Hals-, Nasen- u. Ohrenh. **19**:20 (May 16) 1927.

The relationship between the accessory cavities and atrophic rhinitis presents itself best in the surgical experiment. Repeated flushing of the maxillary antrum with physiologic sodium chloride solution was of undeniable favorable influence on the atrophying nasal mucous membrane. The effect was still more favorable when a slight inflammation was produced in the maxillary antrum. Packing was followed by the best results. The methods in which the accessory cavities form the basis of attack have led to the best results. The problem is thereby settled definitely. Implantation of the ductus stenonianus into the maxillary antrum causes a swelling of the mucous membrane. The presence of fluid is sometimes sufficient to prevent the reappearance of crusts and the progress of the atrophy in the lower and middle meatus and the lower turbinate.

A LARGE MODEL OF THE NOSE. TONNDORF, Ztschr. f. Hals-, Nasen- u. Ohrenh. **19**:83 (May 16) 1927.

Tonndorf constructed a model of the nose, 1 by 1 meter in size, from a head the tissues of which had been fixed while the head was fresh. The model was made of papier maché, and in it are demonstrated the anatomy and the principles of some surgical procedures. It serves for teaching purposes.

AMBERG, Detroit.

Proceedings of German Otolaryngological Society

IMPRESSIONS CONCERNING WEST'S OPERATION, BASED ON SIXTY-EIGHT OBSERVATIONS. M. CHORSHAK, Ztschr. f. Hals-, Nasen- u. Ohrenh. **19**:32 (May 16) 1927.

1. West's operation is performed under local anesthesia, except in early childhood. It is applicable when probing of the lacrimal duct is unsuccessful and when the extirpation of the lacrimal sac, in the presence of at least one normally functioning canal, is indicated. The ages of the patients ranged from 5 to 64 years.

2. The result is immediate and permanent. In suppurative dacryocystitis the suppuration disappears on the day following the operation, and epiphora on the second day after the removal of the packing from the nose.

3. The most conspicuous result is obtained in cases in which the extirpation of the sac is contraindicated (in phlegmons in the region of the sac, or in fistulas in which the extirpation is frequently difficult and may not be followed by good results). The phlegmon heals, even in its acute stage, within from four to five days, and the fistulas, if they are of recent origin or from 6 weeks to 2½ years old, heal within a week, with simultaneous discontinuation of epiphora.

4. West's operation is accompanied by good results in cases in which ophthalmologists have removed the tear sac without a good result.

5. West's operation is not accompanied by complications except, rarely, ecchymosis of the lids, a slight rise in temperature reaching 99.5 F. or tenderness in the region of the lacrimal fossa. All these symptoms disappear a few days after the operation.

6. The result of the operation depends on the size of the opening in the bone, which must be at least as large as the inner surface of the tear sac and as broad as the opening in the same. Hemorrhages during the operation sometimes prevent the carrying out of these plans. When the patient has a relapse he is easily cured when the openings in the bone and the sac are enlarged.

7. The operation can be performed in the outpatient department.

AMBERG, Detroit.

Miscellaneous

RECTAL ETHERIZATION IN MODERATE DOSES IN OPERATIONS ON THE FACE. M. JACOD, Ann. d. mal. de l'oreille, du larynx **46**:583 (June) 1927.

The author believes that rectal anesthesia is the anesthesia of choice in most of the prolonged operations on the nose and the vault of the pharynx. It allows the surgeon more ease and convenience, as well as furnishing a lasting and thorough anesthesia. The anesthesia may be preceded by a narcotic if desired.

The ether is suspended in an oily mixture of camphor and olive oil, in an amount regulated by the age, weight and resistance of the patient. Two formulas were submitted: for a girl, aged 18, weighing 120 pounds (54.4 Kg.), 50 cc. of ether, 20 cc. of oil of camphor 1 per cent, and 100 cc. of olive oil; for a man weighing about 160 pounds (72.6 Kg.), 70 cc. of ether, 20 cc. of oil of camphor 1 per cent, and 100 cc. of olive oil.

The dose is given per rectum, slowly, to prevent any coliky sensation. At the same time, ether may be slowly administered by the respiratory method. As soon as the patient has entered the stage of unconsciousness, the narcosis may be considered complete. Aside from the convenience to the operator, the postoperative discomfort to the patient is appreciably lessened.

The author considers the moderate dosage safer than the American method and equally satisfactory.

ROTH, Kankakee, Ill.

THE TOPOGRAPHY OF THE MOUTH AND THROAT FROM THE POINT OF VIEW OF THE DIRECT ENDOSCOPY OF THE RESPIRATORY AND DIGESTIVE ORGANS. F. HASSLINGER, Ztschr. f. Hals-, Nasen- u. Ohrenh. **19**:42 (May 16) 1927.

In direct endoscopy, a displacement of the organs of the mouth and throat occurs. The angle maxilla-hyoidbone-larynx must be straightened to an obtuse angle. The literature does not mention the position of the cervical spinal column. The author investigated the effect of dorsal flexion of the head: (*a*) in the normal position of the cervical spinal column, (*b*) when it is bent backward and (*c*) when it is bent forward. The head can be bent backward for 30 degrees in the average case. Orthodiagraphic measurements show that in this position the distance cranial base-hyoidbone-sternum is increased to about 3 to 5 cm.; thereby the distance between the cranial base and the hyoidbone is increased from 1 to 2 cm., and the distance between the hyoidbone and sternum about from 2 to 3 cm. Besides, the large horns of the hyoidbone, which lie about in the plane of the posterior wall of the pharynx when the head is in a normal position, shift to a position behind this plane. Also, the epiglottis and the anterior wall of the larynx are drawn backward and approach the spinal column. Only by strong pressure can the mouth and throat be displaced forward. The author cites the disadvantages of this position for direct laryngoscopy and for esophagoscopy. The necessity for employing this position presents itself only when the tube has passed the cricoid cartilage and when it should enter the parts of the esophagus at the spot where the esophagus is bent forward, under the narrow portion of the aorta. The extreme dorsal flexion is decried generally, and only a slight bending back of the head is recommended. The investigations of the author led to the conclusion that the maximal bending of the head backward and, simultaneously, the pronounced bending of the cervical spinal column forward, must be considered the most favorable position in which the tube can be introduced into the larynx, trachea and esophagus. It does not make any difference whether the patient is examined in a sitting position or when he is lying down. In the latter position, the head and cervical spinal column should reach beyond the border of the table. The right hand of the assistant lifts the occiput so that it lies higher than the table. The left hand bends the head maximally backward; hereby, the cervical spinal column is bent forward. In order to fix the upper portion of the patient's body, the assistant exercises a slight pressure on the chest with his left elbow. It was frequently observed that the relaxation of the muscles of the neck was more complete when the patient felt a solid support under his head. The natural movements of the head could not be followed if the existing supports for the head were used; therefore, the author devised a new support to be used in the position set forth.

AMBERG, Detroit.

Society Transactions

AMERICAN LARYNGOLOGICAL ASSOCIATION

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CHEVALIER JACKSON, M.D., *President, in the Chair*

THE TEACHING OF BRONCHOSCOPY AND ESOPHAGOSCOPY. Presented by DR. CHEVALIER JACKSON, Philadelphia.

This article will be published in full in a later issue of the ARCHIVES.

ABSCESS OF THE BRAIN (FRONTAL LOBE) FOLLOWING SINUSITIS, WITH A REPORT OF FOUR CASES. Presented by DR. CHARLES J. IMPERATORI, New York.

The following conclusions were reached: The five patients were under 28 years of age and two of these were young girls. Patient 1 was 27; patient 2, 14; patient 3, 15; patient 4, 21, and patient 5, 25.

All had fronto-ethmoiditis with an abscess of the orbit, a chemosis or edema of the upper lid. In cases 1, 2, 3 and 5, external fronto-ethmoid operations were performed at the onset. In case 4, an intranasal operation was performed four days before the external operation.

The apparent method of invasion of the cerebrum was: in case 1, by direct extension from the frontal sinus with a small amount of osteomyelitis; in case 2, by a metastatic infection; in case 3, by direct extension; in case 4, by direct extension and an osteomyelitis was present; in case 5, by direct extension, although a fistulous tract was not demonstrated.

In case 1 the lesion was located in anterior part of the right frontal lobe. In case 2, it was on the side opposite the frontal sinusitis and in the region of the cribriform plate, that is right sided. In case 3, on the side originally searched no abscess was found, but in the region of the cribriform plate in the right frontal lobe, the abscess was found. In case 4, an epidural abscess was first located in the midparietal area, and later a cerebral abscess was found in the posterior part of the frontal lobe on the side of the frontal sinusitis; that is, a right sided abscess. In case 5, the lesion occurred in the region of the cribriform plate on the side of the frontal sinusitis; that is it was left-sided.

In all there were four right-sided abscesses and one left-sided abscess. Three of the patients with right-sided lesions (cases 2, 3 and 4) had convulsions at some time prior to the evacuation of the abscess. The fifth patient had a temporary aphasia and a pronounced optic atrophy. All the others had slight eyeground changes. The fifth patient had a decidedly changed temperament; the others apparently did not.

Staphylococcus aureus was found in the five cases.

A leukocytosis always above 15,000 and a polynucleosis of 80 plus, were observed.

The prominent symptoms were as follows: (1) headache, especially at night, and located on the side in which the abscess was found; (2) occasional vomiting; (3) chemosis and some eyeground changes — optic neuritis when the abscess was localized; (4) high temperature toward morning; (5) pulse rate usually in relation to the temperature, and not in any case a low rate; (6) insomnia, some mental dulness and poor memory, dependent on the progress of the brain destruction; (7) convulsions; (8) tactico optical aphasia;

(9) diminished abdominal reflexes, contralateral to the lesion; (10) exaggerated knee jerks and ankle clonus usually.

The results of evacuation of the abscesses were: In case 1, the patient was alive two years after the operation, since which time all trace of him has been lost. In case 2, the patient is alive and well. In case 3, the patient lived fourteen months after operation. In case 4, the patient died thirty-six hours after operation. In case 5, the patient died within a week.

ACUTE FULMINATING OSTEOMYELITIS OF THE FRONTAL SINUS; HEMATOGENOUS (?) ORIGIN (DENTAL FOCUS): REPORT OF A CASE. Presented by DR. HILL HASTINGS, Los Angeles, Calif.

This article will be published in full in a later issue of the ARCHIVES.

DISCUSSION ON PAPERS OF DRS. JACKSON, IMPERATORI AND HASTINGS

DR. MICHAEL OSNATO, New York: My remarks will be limited exclusively to the neurologic aspects of abscess of the brain.

The first thing that occurs to one who has had experience with abscess of the brain is that first of all one should not be in a hurry to make the localizing diagnosis, because as a physician becomes more experienced with this condition, he finds that the prognosis is best the longer he waits before performing the operation.

Hence, the neurologist should be given plenty of time to localize the abscess. The symptomatology should be divided into general symptomatology and localizing signs.

In the general symptomatology, headache plays a prominent rôle, particularly in young people — irritability and restlessness should make one suspect the presence of the condition — and then confusion with lapses of memory, what neurologists call amnesic attacks, which are sometimes paraphasic; tenderness on percussion is not particularly of localizing value. This is a generalized sign. Associated with tenderness on percussion is the use of the stethoscope in investigation. Sometimes percussing along the line of the ventricles from behind forward and listening with the stethoscope, one may detect a change in the percussion over the abscess. Ordinarily the percussion note is tympanic when listened to, but over the abscess that tympanic sound takes on a quality of dulness.

Since nonlocalizing signs are generally convulsions, Jacksonian convulsions are of considerable localizing benefit.

As Dr. Hastings brought out in his case, the disks are important, but they are not of localizing value. The most common observation is simply an engorgement of the veins which is greatest on the nasal side of the disks. Optic neuritis is not uncommon in abscess of the brain but papilledema did not occur in my cases. The swelling is part of the inflammatory process and never goes higher than 1 or 2 diopters.

The localizing signs of frontal lobe abscess are unfortunately not striking usually. The abscesses on the right side are particularly difficult, because the right side in the frontal region is not possessed of any strikingly definite functions. However, euphoric states are peculiar to the frontal lobes. The state of euphoria is one in which the patient becomes unusually jocose, flippant even, and exhibits an unusual emotional reaction in the direction of well being out of proportion to the seriousness or apparent seriousness of this illness. Euphoria with talkativeness, mild delirium and confusions is much more common in patients with frontal lesions. Later, of course, stupor and coma may supervene.

With lesions in the left frontal lobe, so-called motor aphasia may be present, the difficulty in that condition being in speech and utterance, rather than in understanding speech.

Dr. Imperatori stressed a sign of considerable value. Early in these cases the abdominal reflexes are disturbed on the side opposite the lesion, being diminished and sometimes absent. When the lesion becomes extensive and is associated with meningitis, as so many of the frontal lobe abscesses are, the abdominal reflexes are not diminished on one side but practically all over.

If the lesion is at, about or in the vicinity of the Rolandic area, ascending frontal, there are changes in the reflexes on the side opposite the abscess. The deep reflexes are increased. On the same side, the abdominals are diminished. One may have a Babinski reflex, of course, on the side of the hyperreflex. Then too, one must not forget that in abscesses of the frontal parietal region, static ataxia and disturbances of station and gait are to be expected and are commonly found, because, as every one knows, the frontal parietal occipital cortex is connected by means of the frontopontal tracts with hemispheres of the cerebellum. They contribute the largest portion of cerebellar hemisphere area. With cerebellar lesions, in addition to this, nonequilibriatory ataxia is present; this condition is tested by having the patient touch the tip of the nose and the eyes, and then touch his fingers together in front. The nonequilibriatory ataxia of the frontal parietal region is characteristic of cerebellar lesions.

A series of important localizing symptoms are due to the involvement of the so-called sensory cortex, the postcentral convolution in the frontal parietal region. These disturbances are chiefly in the form of disabilities connected with the recognition of size, form and shape of objects; disturbance of muscle, tendon and joint sensibility; inability to tell accurately in which direction the small joints of the hands and toes are being moved when the patient has his eyes closed and inability to discriminate between one and two points which are ordinarily promptly recognized by the normal person at 3 mm. In these cases, the points may not be recognized at a much wider spacing.

Another sign of localizing value is hallucinations of smell, involving the olfactory bulb or tract on the orbital surface. Hallucination may also occur temporarily.

The most striking thing to remember about the spinal fluid is that until the arachnoid is involved, the fluid is invariably free of bacteria. In spite of that fact, the cell count may be excessive. That is the most important point of the whole discussion: even with an increase in cells up to several thousands, one never finds an abscess of the brain until it ruptures into the ventricles and invades the cerebrospinal fluid, before which time bacteria cannot be found in the fluid.

Dr. L. W. Dean, Iowa City: I wish to report one case of abscess of the frontal lobe and a second case of chronic suppurative meningitis with involvement of the cortex of the frontal lobe.

The first patient entered my service because of orbital cellulitis. Operation revealed chronic sinusitis with dehiscences in both the inner table and the orbital plate. The dura was covered with granulations, and it was discolored. The wound was left wide open. The patient did not do well. Headache and projectile vomiting were the outstanding symptoms. The neurologist made a diagnosis of abscess of the frontal lobe. A second operation was performed. There was no sinus in the dura. It was incised where it was discolored. At a depth of ¼ inch (0.6 cm.) a fair sized chronic abscess was found. Following drainage, the patient made good progress for one week, and then had a relapse. A second drain was inserted and the patient made an uneventful recovery.

The complaint of the second patient, a man, aged about 35, when admitted to the hospital with persistent headache which was not relieved by glasses or medication. My diagnosis was chronic suppurative ethmoiditis for which an intranasal operation was performed. At the time of the operation the dura was exposed. There was a sinus in the dura through which necrotic brain tissue could be removed. Six days after the operation, the patient became

unconscious and strabismus, vomiting and slow pulse and respiration were present. The sinus was dilated by means of a nasal dressing forcep. All the symptoms disappeared and the patient made an uneventful recovery.

Dr. J. H. Bryan, Washington, D. C.: Dr. Imperatori has referred to one patient I had and I only want to speak of his case in connection with this discussion. This patient was a young boy, 12 or 14 years of age. He had previously been operated on by another surgeon.

I used a demarking fluid injected through the fistulous opening. It showed a well marked abscess. That procedure revealed the abscess sac distinctly, and showed an extradural abscess and a frontal lobe abscess.

This fact is well worth considering as an aid in differentiation. This patient was operated on several times, and I apparently had felt convinced that the abscess had healed.

After an interval of three weeks, I found that he had meningitis, starting along the vascular region and along the cortex. Autopsy showed that the extradural abscess had practically healed. Whether the infection took place through the fistulous opening, one could not tell. This must have been a case of osteomyelitis, too, occurring on the posterior wall.

The case that I reported several years ago was that of a young girl, aged 12, in whom headache developed in the region of the frontal sinus, after swimming. She was operated on, but evidently the operation was not successful because of improper drainage. When she returned to Washington, I found that an extensive osteomyelitis had developed in the frontal bone, the inner wall of the orbit and the superior wall, and I was able to pick out the whole roof of the orbit, intact. Several operations were necessary, but the girl recovered and the condition has never recurred.

Dr. W. V. Mullin, Cleveland: Twelve days ago, a boy, aged 17, with extensive osteomyelitis of the right frontal bone, involving the entire anterior wall of the sinus, was brought under my care. Emphysema of the forehead was present, and the periosteum was denuded to the top of his head. He had an abscess of the septum, and marked deformity of the nasal bones. In addition to this, he presented an osteomyelitis of the upper end of the left tibia, and an abscess in the knee joint. A blood culture was positive for *Staphylococcus albus.* Cultures from the frontal sinus, the septum and the knee all produced *Staphylococcus albus.* Wide and open drainage was instituted. I have not seen him for a week, but I have heard from him, and a new extension has not occurred. The response to a blood transfusion was splendid.

Dr. C. G. Coakley, New York: At Bellevue Hospital, I see a number of cases of orbital abscesses and abscesses of the frontal bone, in which there is distinct swelling and perforation, either of the interior wall of the frontal, or of the outer portion of the ethmoid and also of the anterior wall of the frontal.

The general tendency in these cases is to make the diagnosis readily from the appearances both in the physical examination and in the roentgenograms. My most difficult task is to make the attending surgeons realize that in most of these cases there is an actual bone involvement due to the pressure of the secretions within the cavities whether ethmoidal or frontal. There has been softening and infection of the bone perforation of the bony wall, ethmoidal, anterior frontal or interior frontal, in and around the orbital tissues, with an accumulation of pus in the orbit or into the anterior wall of the scalp external to that perforation in the bone.

The inexperienced surgeon is desirous of clearing up at once the entire diseased process in such a case, and that, I think, is a bad and unwise procedure.

In the case just referred to by Dr. Mullin, as I understand it, all the general surgeon did was to make a skin incision and evacuate the pus that was external to the real source of infection. My experiences in all these acute or chronic cases, in which there is actual softening and infection of the bone, cause me to incise into the abscess cavity, find, if possible, the fistulous point from which

the original suppuration in the ethmoid or frontal regions came, slightly enlarge that opening to facilitate drainage, put in, if necessary, either a drainage tube or a cigaret drain, and permit that inflammatory process to subside. Then later I go ahead with whatever surgical procedure may be necessary to remove the entire process. If that method of treatment is undertaken, I feel sure that there will be many less cases of osteomyelitis of the frontal and ethmoid region, than if complete surgical operation is attempted during the time when the abscess has broken through into the soft tissue that softens the bone and presents an area of bone which is readily infected.

There will be fewer cases of osteomyelitis if they are handled in that way.

DR. JOHN F. BARNHILL, Indianapolis: It seems to me that the methods of invasion of the brain will have to be studied more carefully, and the present views revised in a measure. Physicians are given too much to believe that an abscess of the brain will be found in the exact vicinity of the sinus disease. I am convinced from my experience, and from what I have learned from others, that abscess of the brain occurs at least as often from transfiltration through the blood stream, as it does through contact.

I am of the opinion that a great many cases of abscess of the brain due to suppuration of the frontal sinus are overlooked, and that the cause of death is not definitely known. I have seen two cases of cerebellar abscess found only on postmortem examination, which were due to disease of the frontal sinus.

I have also seen several cases of abscess of the brain that were due to lung suppuration; this proves that the infection may be transported a long distance.

The abscess of the frontal lobe is the most difficult of all abscesses to diagnose. There are seldom any local symptoms and often no eye disturbance. Papilledema is not often present for the reason that papilledema is due to intercranial pressure, and unless such pressure develops in considerable degree eye symptoms do not record the presence of the abscess. Headache is frequently present and is severe. Persistent headache in the presence of sinus disease should arouse a strong suspicion of abscess of the brain. The location of the headache is seldom an indication of the location of the abscess. Sometimes, headache is in the frontal region when the abscess is in the cerebellum.

DR. HENRY L. SWAIN, New Haven, Conn.: Dr. Imperatori referred to the case I spoke of last year when discussing Dr. Hurd's paper. I just want to make it clear that the patient died not because of abscess of the frontal lobe—that would not have troubled us much—but from progressive osteomyelitis which went back and settled in the whole top of the skull.

I reported the case last year because of the interesting juxtaposition of two cases exactly similar. One patient recovered and the other died.

DR. GEORGES PORTMANN, Bordeaux, France: I wish only to discuss some small points about the diagnosis of abscess of the brain. It is difficult to diagnose abscess of the brain, and one is accustomed to divide the symptoms into three subdivisions: symptoms of hyperpressure, of infection and of localization.

The symptoms of hyperpressure include headache, slow circulation, slow pulse and many others.

The symptoms of infection are fever and emaciation. Great attention is given to the symptom of emaciation. When a patient thought to have an abscess of the frontal lobe or cerebellum shows a loss in weight of 15 or 20 pounds (6.8 or 9 Kg.) this is considered an important symptom of abscess of the brain.

The symptoms of localization, the third part of the diagnosis, are sometimes difficult. In the treatment of patients with this condition, I use a metallic drain, two valves with a spring, and the two valves separate the two parts of the abscess.

DR. L. VAN DEN WILDENBERG, Louvain, Belgium: I find that when osteomyelitis is present at the same time as trauma of the frontal sinus, the prognosis is much better than in other cases of osteomyelitis.

I had the opportunity to operate in two such cases two or three weeks after the trauma, and both of the patients were cured. I would not perform too radical an operation on the frontal sinus, but merely institute drainage.

I discussed this case in a paper before the last International Congress.

Dr. H. G. Tobey, Boston: I would like to add one other case of acute frontal infection. Most of these abscesses of the frontal lobe are found in young people. A girl, aged 16, was at a summer camp in Maine, when she had an acute frontal sinusitis, which perforated into the outer angle.

First, a radical operation was done on the frontal sinus. At that time a minute area of disease of the posterior plate, not more than 3 mm. long, was found. That was all that was done then. She was kept in bed for two days, and was greatly improved. On the third day, the symptoms of headache and vomiting returned. Entrance was made through the original wound and the abscess was found 3 inches (7.6 cm.) above the perforation of the frontal. This was drained and she has been doing well since.

When osteomyelitis starts one never knows what is going to happen. There is hardly any way to forecast whether it will become localized or will go on as a diffuse spreading process.

Dr. C. J. Imperatori, New York: Dr. Osnato mentioned and stressed the symptom of smell being disoriented or not present. Not in any case was the sense of smell affected, and in the last case the abscess was directly adjacent to the olfactory lobe.

It is well known that abscess of the brain in children under 4 or 5 years of age is frequently in the frontal lobe, resulting from abscesses of the lung, from long bone infections and from tonsillectomies.

I do not think this is the proper method of treatment in cases of abscess of the frontal lobe even though two of my patients improved. It seems to me that the opening of the brain and the placing of the tubular drain in it is not the correct method of procedure. I think to aspirate and reaspirate would be a better procedure.

Dr. Hill Hastings, Los Angeles: In regard to the case, the history of which was under discussion, I finished the operation with the feeling that the patient was going to die of meningitis. The only wise thing I did, I believe, was not to go any further.

Malignant Tumors of the Nasal Sinuses: A Further Report on the Results of the Wide Open Operation Followed by Immediate Irradiation. Presented by Dr. Harry A. Barnes, Boston.

This article was published in the Archives, August, 1927.

DISCUSSION

Dr. W. B. Chamberlin, Cleveland: In each of three cases of malignancy of the antrum and the ethmoid there was marked exophthalmos. In all of these patients, a Caldwell-Lue operation was performed and radium emanations were applied. All the patients have apparently recovered and have remained without recurrence for three years.

Dr. T. E. Carmody, Denver: When there is only involvement of the maxillary sinus, I make the entrance through the mouth, and use the soldering iron and diathermy.

In a number of these cases, I have had marked success and my longest period of observation of a case is about seven years.

Dr. John F. Barnhill, Indianapolis: During a session like this, one point should be made. What the speakers have said concerning the work they do is splendid. The results Dr. Barnes has attained are unusual. The point I wish to make is that these malignant cases should be diagnosed earlier. Most of the patients can be cured if seen early. Those seen late are almost never cured.

THE RÔLE OF SURGERY IN THE MODERN X-RAY TREATMENT OF CANCER IN THE LARYNX. Presented by PROF. GEORGES PORTMANN, Bordeaux, France.

Under local anesthesia a partial or total resection of the thyroid cartilage is done without entering the laryngeal cavity. The external perichondrium is sutured, and healing takes place by first intention. Roentgen-ray treatment is usually begun within from eight to ten days afterward.

DISCUSSION

PROF. L. VAN DEN WILDENBERG, Louvain: In the treatment of cancer of the larynx, the best results are obtained from the combination of surgical procedures and roentgen-ray therapy. Excellent results follow even surgical procedures alone.

When cancer extends to the extralaryngeal regions, roentgen-ray therapy alone should be resorted to. One must admit, in fact, that surgical measures have not proved to be of great advantage in such cases, but it is a question whether or not the high mortality following operation in these cases is due to the use of a general anesthetic. I am inclined to believe so, and suggest that operation be tried, at any rate, under local anesthesia.

In regard to the result of such an operation, however, one must not conclude too soon that the patient is cured.

DR. J. E. MACKENTY, New York: I am very much interested in Dr. Portmann's method of opening the larynx for the use of radium. He has invented this method of approaching it, so that the cartilage will not be injured by the radium. That is an improvement on anything that has been advocated so far in the treatment of patients with cancer by radium.

In anesthesia, procaine hydrochloride in 1 per cent solution is used. The procaine hydrochloride is sterilized by filtration.

I have not seen squama cell cancer cured by radium. Perhaps in France, patients with this condition are cured by roentgen-ray treatment.

Concerning pneumonia, in 160 laryngectomies to date, I have had one death from bronchial pneumonia and no mediastinitis. Success lies wholly in keeping the secretions from the lung and giving little anesthesia. I use local and general anesthesia combined.

PROF. GEORGES PORTMANN, Bordeaux: In France, radium is rarely used now in the treatment of cancer of the larynx, but roentgen-ray therapy is often resorted to. I have never seen a case in which cancer of the larynx was cured by radium. The purpose of the operation dealt with in my paper is solely to assist the roentgenologist to apply roentgenotherapy properly.

LARYNGEAL COMPLICATIONS OF IRRADIATION. Presented by DR. LOUIS H. CLERF, Philadelphia.

This article was published in the ARCHIVES, October, 1927.

DISCUSSION

DR. D. BRYSON DELAVAN, New York: During the many years since I began the study of laryngeal cancer, many new propositions, ideas and methods have been proposed and tried, but the disease has continued to exist. Many have died from it; a few have been relieved, or are still praying for the time when an actual cure shall be found. No suggestion, therefore, offering a possibility of advance, should be ignored.

With regard to radium, the examples of injury attributed to it which have first been exhibited would seem due to its misuse. While opinions are conflicting as to the value of radium in laryngeal growths, properly applied, it has by no means always given the results which have just been indicated

to us. While many insist that surgery is the only reliable procedure, may there not be certain cases amenable to cure by radium? I think there are. At the Memorial Hospital, New York, I have been treating a number of patients for several years past and have obtained certain results. Rather than rely on any statement from me, let me extend an invitation to you from the director of the Memorial Hospital, who writes to this effect, "We have a great mass of material at the Memorial Hospital and if it meets with your approval, I shall get the data in order and, a little later, would like to have a group of your friends most interested, look these cases over with me at the hospital. I am sure we can show some very interesting material."

The value of radium in the cure of papilloma of the larynx was first demonstrated by Dr. Robert Abbe of New York, many years ago. While it may not be effectual in the multiple papillomas of children, its value in other forms has been found. I have been greatly interested in the suggestions offered by Professor Portmann, and shall be glad to give them careful consideration.

PROF. GEORGES PORTMANN, Bordeaux, France: In France we are as pessimistic as you are, but we have not the right to condemn a method before trying it.

DR. SAMUEL IGLAUER, Cincinnati: About one year ago, I collected a series of cases of necrosis of the larynx following roentgen-ray treatment for carcinoma and other diseases. These necrotic cartilages were not due to the carcinoma because it occurs in other cases, for instance, when the neck has been treated for tuberculous glands, goiter and other conditions. Hence, the destructive action must be due to the roentgen ray, and not to disease.

One can never tell if one radiates a patient's larynx, whether or not that patient will subsequently undergo this late reaction. Marcheck has given a name to this. I believe he calls it perichondritis radiotherapeutica — a distinct disease.

DR. NORVAL H. PIERCE, Chicago: Shall one do a biopsy on a small, primary intrinsic carcinoma of the larynx when that carcinoma is to be treated by radium or the roentgen ray?

I saw the patient whom Dr. Clerf treated with radium by his method. The lesion was a small, nonulcerative, fusiform swelling in the middle portion of the right cord with little hoarseness, merely a huskiness, and little, if any, change in the action of the cord. As I say, he irradiated it just about that time. The case has recurred, and the man now has a tracheotomy tube.

DR. CHEVALIER JACKSON, Philadelphia: It seems to me important to draw a sharp line of distinction, between cancer of the larynx and multiple papillomas of the larynx, especially in children. Multiple papillomas of the larynx constitute in many cases a benign self-limited disease that will get well if you let it alone. Conservative treatment is imperative. With cancer of the larynx, if it is left alone, there is only one end — the limit is life itself. Radical treatment is justifiable.

DR. LOUIS H. CLERF, Philadelphia: I believe that there must be a limit to the use of radium and the roentgen ray in the treatment of conditions that can and have been treated successfully by other methods.

I was much impressed with Dr. Portmann's remarks regarding the late unfavorable results, which bear out those which I have observed. My attention was first called to this by Dr. W. S. Newcomet, in charge of the radium department of Jefferson Hospital. He reported the case of a patient who had received roentgen-ray treatment for an angioma of the face. Two years after, there was breaking down of the skin over the involved area; this again occurred four years afterward.

I reiterate, being supported by the president of the association, that the roentgen ray and radium are to be condemned in the treatment of multiple papillomas of the larynx in children.

THE EARLY DIAGNOSIS AND TREATMENT OF EPIGLOTTIDEAN TUBERCULOSIS. Presented by DR. FRANK R. SPENCER, Boulder, Colo.

This article appears in this issue, p. 413.

AN OPERATION FOR THE RELIEF OF ABDUCTOR PARALYSIS OF THE LARYNX. Presented by DR. JOHN EDMUND MACKENTY, New York.

The operation devised by me and successfully carried out on several patients is extremely simple. It aims at the establishment of a small permanent opening in the trachea at a point just above where the trachea dips backward into the chest. When such union is established, little contraction in the tracheal opening occurs, and the cannula can be dispensed with. In practice, it may be difficult to obtain perfect accomplishment of the operation, since its success depends entirely on securing a skin mucous membrane union free from scar tissue.

The incision is made in the center line of the neck beginning over the thyroid cartilage and extending downward about 2 inches (5 cm.). It centers over the thyroid bridge. This bridge is excised close to the thyroid lobe on either side. The pretracheal muscles are removed in the operative area. This exposes an inch or more of the trachea. The tracheal wall is then anesthetized. Between two rings, a few drops of a 10 per cent solution of cocaine and five drops of epinephrine hydrochloride are instilled into the lumen of the trachea to allay coughing. An oval section of the tracheal wall is next removed, care being taken to leave the tracheal mucous membrane intact. This oval section should be 1.5 cm. long by 0.75 wide. In the process of healing, this opening contracts to a hole about 0.5 cm. in diameter.

Flaps of skin are prepared by undermining, by removing all fat from the edges of the flap and by incisions on either side of the central one and parallel to it. All tension on the line of union between the tracheal edge and the skin must be relieved. If one has been successful in removing the oval section of tracheal wall without perforating the mucous membrane the procedure is as follows: The flaps of skin are brought to the center and united to the edge of the oval. The diaphragm of mucous membrane closing off the wound from the lumen of the trachea, is left intact for four or five days. Then it is split in its long axis and laid up against the union mentioned previously, where it is held by the obturator which will be described. If the trachea has been opened by a tear in the mucous membrane diaphragm, then the flaps are secured at once to both the mucosa of the trachea and the edges of the oval. The obturator is inserted at once, or the opening is plugged with bismuth paraffin gauze. The central incision is closed in the usual way. The latter incision is not closed. Two flat hooks made of fairly rigid silver serve to hold the flaps to the center and to relieve tension. It is essential that no stitch pass through cartilage on account of the danger, necrosis and infection. Individual choice may dictate whether a rotated flap should be used or one made by incising the skin parallel to the original incision on both sides. The former gives less tension, the latter a better blood supply.

During the healing and contraction period a small solid obturator made of silver and attached to a cross piece, as in the tracheal cannula, must be worn. The tracheal end of the obturator should project but little beyond the inner surface of the trachea. If dyspnea is constant, an unusual condition in my experience, the obturator may be made tubular, or a short small tracheal cannula may be submitted.

DISCUSSION

DR. H. L. SWAIN, New Haven, Conn.: On a certain occasion, I suggested to a patient with bilateral paralysis that he should have an intubation done. He wore the tube, and for some reason or other, his cords gradually assumed normal position; hence, in the later period of this trouble, he only wore the

tube at night. He introduced the tube himself. In the day, he took it out. Ultimately, after about two or three months, he was able to get along without any tube; for years afterward, he remained cured.

Stimulated by this experience, I tried it in another case, and was equally successful. However, in the second case, much of the success may have been due to the antisyphilitic treatment.

Dr. W. V. Mullin, Cleveland: I do not know of any condition more distressing to have to deal with than bilateral abductor paralysis. There are some points on which the profession at large, I believe, do not quite agree. One is the incidence of laryngeal paralysis before operation on the thyroid.

I have, at different times, seen in print that there is impairment of the recurrent laryngeal nerve in about 25 per cent of the cases of goiter before operation. At the Cleveland Clinic, I find little laryngeal paralysis due to an enlarged thyroid prior to operation. An exception to this may be found when the thyroid is malignant and in a few cases of intrathoracic goiter. When a preoperative laryngeal paralysis is discovered, the cause is sought and usually found in the mediastinum. In bilateral abductor paralysis when the cords are in the midline and a tracheotomy is required, the cords will vibrate; such patients will have a good voice even with the tracheotomy tube in place. When any type of operation is proposed that will give them an air way and allow them to dispense with the tracheotomy tube, but will sacrifice their voice, these patients will choose to retain the tube and not sacrifice their voice.

Dr. John Edmund MacKenty, New York: Why use a tracheocannula if the method just presented will serve the purpose? The cannula often irritates the trachea. This procedure has been used only a few times. I am not sure whether it is good or not. It has been successful in most of the cases. The danger of sudden death is obviated. The patients can talk normally, which is not the case after other operations.

Pulsion Diverticulum Combined with Mega-Esophagus. Presented by Dr. L. van den Wildenberg, Louvain, Belgium.

Deep Actinomycosis of Neck and Mediastinum. Presented by Dr. L. van den Wildenberg, Louvain, Belgium.

These two articles will be published in full in a later issue of the Archives.

Paranasal Sinus Disease in Infants. Presented by Dr. Lee Wallace Dean, Iowa City, Iowa.

The following systemic complications are considered for their influence on the treatment of infections of the paranasal sinuses: nephrosis, dehydration, diarrheal fever, refusal of food, infectious arthritis, bronchiectasis, asthma, diabetes, being a diphtheria carrier, sudden elevation of temperature without apparent cause and recurring fever with vomiting. Close cooperation between the pediatrician and laryngologist is most important.

DISCUSSION

Dr. James A. Babbitt, Philadelphia: Dr. Dean is a pioneer in the study of the paranasal sinuses. In my children's hospital work, I find three types of work, two of which are well handled, and the other extremely inefficiently. In the tonsil and adenoid group, the middle ear and the mastoid, results are good; but in chronic purulent rhinitis, they are not very good.

I would like to ask Dr. Dean how he uses ephedrine, and whether he has tried it internally; also how he uses ethylene gas.

I wish he would also indicate, if he cares to, how he takes roentgenograms of the child who is difficult to manage with successful results.

Dr. Emil Mayer, New York: The medical profession is particularly interested in this subject, and Dr. Dean has done epochal work. Dr. Dean has great opportunities in a large hospital with men on full-time service, associated with orthopedists and pediatricians and all other physicians that he can call in; he is thus enabled to do colossal work which is calling the attention of the entire profession to the importance of having the rhinologist make as careful examinations as are necessary and, above all, showing the importance of teamwork.

Dr. Harry W. Lyman, St. Louis: Pediatricians say that many of the cases of so-called cholera infantum are due, not to improper feeding, but to some parenteral infection. The commonest site is in the ear, nose or throat, sometimes in all. Removal of the focus of infection is the most efficient therapeutic measure.

The use of ephedrine, I think, is helping a great deal in the treatment in these nasal cases. It causes a more prolonged shrinkage than any other agent I have tried, and following it I have not observed the reaction which follows epinephrine hydrochloride and similar drugs.

I believe that the one thought to be borne in mind is: the closer the teamwork in these cases, the better will be the results; and the solution of the problem depends, not on the pediatrician, and not on the otologist or rhinologist, but on the closeness of the cooperation between them.

Dr. L. A. Coffin, New York: It is well known that this is a subject in which I have been interested since early days — the days Dr. Meyer spoke of. The profession in our specialty are indebted to Dr. Dean for keeping this subject before us. I do not think there is any question in regard to Dr. Dean's statements regarding these cases. We know of the problems, and if it were only for us, he would not need to keep telling about them; but we are not able to convince the other physicians. The pediatricians in the West, I think, especially Iowa and St. Louis, have appreciated it more; in the East, we have not.

At a joint meeting between the Philadelphia and New York physicians, I spoke for the laryngologists. Although I was to talk about operative work on the sinuses, I said I was going to get away from that subject and speak of sinusitis in children, which I felt that we were not doing in the East. I stated that if Dean was right, we were falling down before an opportunity and an obligation. I was surprised, during a private talk with one of the most able men of this association, when he said that he thought Dean had been a little extreme; he did not believe that he was on the right track. If he is here, this is a good opportunity for him to tell us exactly what he believes.

Dr. R. H. Skillern, Philadelphia: I have to accept the challenge, and admit that I was the man Dr. Coffin was referring to. It seems to me that the object of any discussion is to sustain the speaker, to add something new or to disagree with him. Unfortunately, I am not in any of those positions.

Some years ago, in New York, Dr. Dean first brought this matter to the attention of the Triological Society. I went back to Philadelphia and started working along those lines. Neither my friends nor I could find any cases of low grade inflammation, in which the symptoms were so vague, as described by Dean. So then I went still further. I went to my friends in New York and Boston, and asked them about it. They said, "No, we do not see such cases."

From 1920, to the present time, I have looked for these cases, and still they do not come to my attention. I cannot find them.

I have come to this one conclusion: the prevalence of sinusitis is much greater in Iowa City than it is on the eastern seaboard, and particularly as far as Philadelphia is concerned.

Dr. Cornelius G. Coakley, New York: Dr. Dean has brought to us the continuation of his studies and they are exceedingly valuable. I wish to present my testimony as to the value of ephedrine in the treatment of children

with these acute conditions. Previous to ephedrine, epinephrine hydrochloride was used, and the results were most unsatisfactory. One seldom sees any reactionary swelling after the use of ephedrine, but to get satisfactory results in these cases, ephedrine must be used as Dr. Dean spoke of, and that part I wish to stress; namely, that it is not of any value to have the nurse spray the nose with a simple spray or drip it in with a dropper. That only accomplishes a little of the contraction; but if five or ten minutes after it is used, a second application is made in any manner desired, and if the nose does not become patent, a third and similar application at similar intervals is administered, until the air passages are free. Then the muscle membrane will be contracted, and there will be a chance for self-evacuation of the contents of these various cavities.

I am interested in Dr. Dean's remark about the effect of climate on these children. My experience with older cases as I see them in New York has been different.

The difficulty in New York is in the hospital organization. The special hospitals for children do not have men associated with them except as consultants, and these consultants do not see them properly. They run in for a few minutes to look at an ear or some orbital complication or some other disease, but do not do as Dr. Dean does in his hospital when he studies the cases with the pediatrician. Until the special hospitals, such as the one which Dr. Coffin is connected with, and the New York Eye and Ear Infirmary, are associated with a general hospital, there will be little or no progress in New York in the study of this class of cases, which are so important.

Dr. Norval H. Pierce, Chicago: I hesitate to say what I am going to say, because at the beginning I was impressed perhaps with the delusion that Dr. Dean was seeing things that the rest of us do not see, but I am now busily engaged in the study of the formation of the accessory sinuses in embryos and infants. Whether Dr. Dean is right or wrong, I am going to present this thought. First, there is an enormous difference in the morphology of the accessory sinuses and the mastoid in the infant and in the adult. In the infant there is a direct communication both in the mastoid and in the accessory sinuses between the submucosa and the narrow spaces. In the adult, these communications are closed off by bony tissue. The sphenoid, of course, forms after birth as does the frontal sinus. The ethmoids form differently than do the mastoid pneumatic spaces and enlargement of the maxillary antrum.

The posterior and anterior ethmoids are formed at birth; that is, these cavities proceed to multiply after birth both numerically and in extent, i. e., in extent of each individual cell. They form directly in the ethmoid cartilaginous block. The first sign of the formation of an ethmoid cell is a disturbance of the cartilaginous cells themselves. A certain fossa is created, the cartilaginous cells enlarge and seem to spread to the surroundings and then a blood vessel bud will appear. The moment the blood vessel bud appears, there is a delicate formation of long processes from some of these cartilaginous cells that have already existed. There is no bone at this time.

Further on, the glands will be seen to enter this matrix; soon after that, the surface epithelium will be set down as solid process of cells, and then these cells will split, forming a cavity between the two surfaces. Thus, gradually, a cavity is formed, covered by epithelium, cylindric epithelium and a large surface of subepithelial mucosa, embryonic connective tissue; and then in the meantime, the bone is forming to surround this cell and to delimit it.

One must keep these factors in mind when talking about these mysterious things. Dr. Dean is right, at least, partially right, after all. Perhaps therefore, it is not altogether a matter of patience per se; this peculiar group of cases may be accounted for by the material that is being infected, the peculiarities of the domain that is infected, and it may be even something else; it may be some constitutional imperfection that interferes with the proper lumenization process in this region.

SYMPOSIUM: SUPPURATION OF THE LUNG

ABSCESS OF THE LUNG. Presented by DR. THOMAS MCCRAE, Baltimore.

THE LARYNGOLOGIC ASPECT. Presented by DR. JOSEPH H. BRYAN, Washington, D. C.

THE ROENTGENOLOGICAL ASPECT. Presented by DR. WILLIS F. MANGES. Philadelphia.

THE BRONCHOSCOPIC ASPECT. Presented by DR. GABRIEL TUCKER, Philadelphia.

THE SURGICAL ASPECT. Presented by DR. WILLY MEYER, New York.

All of these articles will be published in full in the ARCHIVES.

TWO UNUSUAL ACCIDENTS IN RHINOLOGIC SURGERY

Presented by DR. WILLIAM B. CHAMBERLIN, Cleveland.

Successes, as a rule, are easy to report. It is always a personal satisfaction to speak of one's triumphs over difficulties. Such triumphs spur one on to the overcoming of even greater difficulties. By the same token, one is wont to dwell at length and even fondly on successful investments, and to pass lightly over, or even not mention at all, those which have been less fortunate. Often, however, one learns more from failures than from successes, and the reporting of such failures helps others to avoid some of one's own pitfalls. In this spirit I will report two operative accidents which have occurred in my own experience.

The first case was that of a patient in whom part of the blade of a Hartmann conchotome was broken and later found by means of the roentgen ray to be in the antrum. The broken blade was later removed by way of the canine fossa.

The outcome of my second mishap was less fortunate. An antral puncture followed by the injection of air resulted in emphysema of the floor of the mouth and the right peritonsillar region. This was followed by infection and death within a week.

Sudden deaths, evidently from an air embolus, following exploratory puncture of the antrum have been reported. Deaths from subsequent infection would seem to be less common. The foregoing case is reported to show again how a procedure that is looked on as of relatively slight danger can be followed on occasion by most unfortunate results.

DISCUSSION

DR. WILLIAM V. MULLIN, Cleveland: I recall that when Dr. Frazer was our guest, he stated in one meeting that he thought there should be a meeting each year at which only mistakes would be reported. Dr. Chamberlin has followed this suggestion. It always requires courage to tell about mishaps.

DR. J. H. BRYAN, Washington, D. C.: Accidents can happen to any one. It is always wise to report these accidents to the members of the association, in order to keep before us the fact that no one is immune. I had an accident in puncturing an antrum in a case in which I had performed puncture several time before.

I doubt whether it is wise to use air after the cannula has been introduced into the antrum. I believe it is always safer to produce suction first to determine whether there is any secretion in the sinus and then to irrigate with physiologic sodium chloride solution. I believe the use of air is dangerous.

DR. GEORGE FETTEROLF, Philadelphia: In view of the many fatalities reported, I have for many years refrained from injecting air through the

cannula. To avoid this possibility one must make sure that the cannula is patulous and that its point is not embedded in the lining of the sinus. To determine this, I pass a small Yankauer flexible eustachian bougie through the cannula after the latter has entered the sinus. If the tip of the bougie passes well beyond the end of the cannula, I feel safe. If it does not, either the end of the cannula is embedded or it is plugged with a bit of bone picked up in passage through the naso-antral wall. By obvious maneuvers these possibilities are eliminated, and when the cannula has been proved to be free, I proceed with irrigation. If trouble should follow then, one can feel that all possible precautions have been observed.

A second point is this: It is well known that the interior of the sinus is frequently traversed by ridges of muco-covered bone. I believe that in some of these accidents the point of the cannula may have pierced the mucosa of such a ridge located so as to be in line with the entering point. The actual presence of such a ridge cannot be determined beforehand, but the potential presence of such a structure always should be kept in mind.

Dr. Frank Robert Spencer, Boulder, Colo.: During irrigation of the left maxillary sinus in a nurse employed in my office, the needle evidently became engaged under the mucous membrane, and after the completion of irrigation with the solution, air probably caused the cheek to bulge. There was an emphysema of the face and cheek. Ten days passed before the condition cleared up.

Dr. C. G. Coakley, New York: I too have had the misfortune to have a part of the Hartman forceps break while I was making a large naso-antral opening in the right maxillary sinus. The roentgenogram immediately showed that it was there. Some time later, I had little or no trouble in passing a hook curet down the anterior margin of the opening and dislodging and removing the instrument.

Recently, another accident occurred. Following a mastoid operation, a boy, aged 8 or 9 years, was exceedingly delirious as he was coming out of the anesthetic. The nurse reported it, and I asked that a hypodermic injection of morphine be given in order to quiet him. Two nurses and the father of the boy were present. The two nurses could not manage the child. The father volunteered to help and hold the leg of the patient while one of the nurses gave the hypodermic injection. As the needle went in, the boy gave a sudden jerk of his leg; the father did not hold it, and the needle broke off in the skin. Six weeks later, the father and the mother wanted the needle removed, and they employed a surgeon to explore the region in which the roentgen ray showed that the needle was still in position. After exploring for an hour and a half, he failed to find the needle.

The second case was one of infection following treatment of the antrums. I think that the people who use needles for injecting and washing out maxillary sinuses are much more apt to get into trouble than those who use a larger cannula with an end that is not so pointed.

My admonition is that after the instrument is passed in it should be moved to ascertain that the end is free. One can get a sense of pressure at the end of the cannula, if it is up against the opposite wall and one does not feel that sense of freedom. I never inject air.

Dr. L. A. Coffin, New York: The one thing which has not been mentioned that I think one should always keep in mind and look for is the anatomy of the head itself. I think it is possible to puncture and almost take out the anterior wall with the needle, or, if it is a large sized cannula, to puncture so that the opening will lie outside the bone.

As Dr. Coakley suggested, I use a large cannula and trochar for most of my punctures, but I like to use the chisel and make an opening. If the cannula is small, one can wash out at any time, through the opening. It is long enough to obtain cure in ordinary cases without further surgical intervention.

In regard to the matter of air, if in doubt, one can use the Yankauer bougie to determine whether the cannula is far in the antrum.

Dr. John F. Barnhill, Indianapolis: The speakers have not indicated the part of the antrum into which the puncture was made. Operators use different methods: Some make an entrance through the normal opening; others puncture under the inferior turbinate. If one punctures through the normal opening, or near the normal opening which is already closed, and then irrigates through the same cannula with which the puncture is made, it is evident that all the pressure used will be pent up in the antrum, and that an accident such as has been reported may follow.

I have had one accident in which water entered the orbit from puncture and irrigation through the ostium maxillaire. Since then I have never followed this method. I believe that the entrance to the maxillary sinus should always be made under the inferior turbinate. After the antrum is punctured it is a good rule to enlarge the opening, even though the case is acute, since more than one irrigation usually is required and a large primary opening facilitates immediate drainage, obviates danger due to irrigation and does not require subsequent rasping.

I have a positive feeling that when a broken instrument is lost in the antrum, it should be recovered at once. If it cannot be recovered through the opening already made, one should make an opening through the canine fossa (Caldwell-Luc operation) for that purpose. To allow the patient to go home carrying such a foreign body in the antrum exposes the operator to the risk of suit for damage. I know of one such instance.

Dr. Thomas E. Carmody, Denver: I have pierced the face on two occasions—of course, one tries not to make the same mistake twice, but I have—and I have pierced the orbit, and in both cases it happened in the hospital; I did not have air, so I injected fluid. The orbit was pierced in a child, in whom the maxillary sinus was small.

An associate of mine pierced the posterior wall. There was a great deal of emphysema. It happened, in that case, that air was injected into the nasal pharynx. The patient complained of a great deal of pain in the side of the head. In the other cases, of course, the swelling disappeared within a few days.

Dr. Max A. Goldstein, St. Louis: I think the whole question of the antrum, especially in acute cases, is a matter more of physics than of technic. The physics of the relationship of the trochar to the antrum wall is the relationship ot air to the surroundings of the trochar. In other words, I always make a sufficiently large opening in the antrum before the trochar is introduced. If a trochar is in place at the antrum, whether air is pumped in or not, there is less risk if the opening is large enough to fit the trochar snugly. If it fits too snugly, the chances are that the air cannot possibly escape through the antrum wall inside the trochar.

I believe if it were made the practice to constitute sufficiently large openings in the antrum wall, that there would be a minimum of air and emphysematous accidents.

Dr. William B. Chamberlin, Cleveland: In reply to Dr. Bryan in regard to suction, I have several objections to its use. In the first place, if the fluid has not entirely filled the antral cavity, it is easy to see how the needle may lie with its point above the fluid level so that one will aspirate and not get any pus. Again, if the pus is thick, as it not infrequently is, none will be aspirated.

Fetterolf's suggestion of passing the flexible bougie through the trochar is interesting to me. Air emboli with sudden death immediately after the injection of air have been reported occasionally. Dr. Spencer spoke of losing the point of the chisel in a septum operation. Two or three times, I have pulled out the Ballenger swivel knife and found the blade missing. It was usually not difficult to recover.

The hypodermic accident which Dr. Coakley spoke of is not uncommon in any hospital.

The question of fluid versus air I discussed in my paper. One realizes, of course, that there is a possibility of spreading infection by either method, air or water, but it has always seemed to me that there was much less danger of introducing infection by the use of air, than by the use of water. The bony plug which Dr. Coakley referred to, if it happens to lodge in the tip of the needle, can easily be disengaged by running a wire through the needle and so forcing it out.

Often a considerable amount of force is necessary in these cases. In this procedure, with the needle entering through the inferior meatus, first the air and then the water are forced out through the natural opening. If this natural opening is small or if it is overhung by polypi or polypoid tissue, or if the pus is thick, naturally, considerable force will have to be used in forcing either the air or the water through.

Dr. Coffin's reference to the anatomy is certainly timely. Any one who has dissected or examined a large number of heads, will have realized the great variation in the shape of the antrum.

Dr. Barnhill refers to the point at which the puncture was made. The puncture was made in the usual position, beneath the attachment of the inferior turbinate. That location is adopted by practically all rhinologists at present.

Dr. Barnhill's reference to leaving the foreign body in situ in the antrum and having this patient subsequently go to some one else, is timely. This certainly might result in a damage suit.

THE VARYING SYMPTOMATOLOGY OF CHRONIC MAXILLARY SINUSITIS, DEPENDING ON THE PATHOLOGIC PROCESSES PRESENT. Presented by DR. FRANCIS P. EMERSON, Boston.

1. The pathologic processes in chronic maxillary sinusitis have been worked out by Dean and Dmochowsky.

2. A clinical classification of symptoms was made based on each process.

3. An attempt was made to predict clinically the dangerous cases and the pathologic change that justifies such a conclusion.

4. Chronic, catarrhal, maxillary sinusitis is of importance principally in that it leaves a thickened membrane.

5. Chronic maxillary sinusitis as the result of a suppurative process can be divided into three classes: those showing a thickened membrane and free pus; those showing a thickened membrane and no pus, and those in which the lining membrane is undergoing a retrograde or degenerative process, and in which the secretion is serous or gelatinous. In the first class the lining membrane is involved superficially, usually. In the second and third classes are the dangerous cases.

6. Illustrative cases were presented.

7. The treatment was described.

DISCUSSION

DR. WILLIAM MITHOEFER, Cincinnati: I wish to give my hearty endorsement to Dr. Emerson's paper, and to present the impressions that have arisen in my mind regarding hyperplastic maxillary sinusitis. Two years ago, I reported forty-eight cases of hyperplastic maxillary sinusitis, and from observation and study of these cases, certain pertinent facts have arisen.

First, I have seen cases in which the hyperplasia was located in the recesses only, with the cavity of the antrum free and a considerable amount of pus found in the recesses, immediately under the hyperplasia. Systemic infection from nasal sinus disease takes place by way of: first, the lymph stream; second, the blood; third, swallowing of mucopus; fourth, aspiration into the lower respiratory tract, and, fifth, toxemia.

Marked tinnitus with a toxic neuritis of the eighth nerve is often caused by hyperplastic maxillary sinusitis.

Nasal changes include vasomotor rhinitis, supraturbinal hyperplasia, ethmoid hyperplasia and hyperplasia of the mouth of the eustachian tube and of the pharyngeal and epiglottic folds.

In clinical examination, a diagnostic tampon in the middle meatus, allowed to remain from four to six hours, is important.

Too much reliance must not be placed on roentgenograms. Some roentgenograms are clear, and still hyperplasia may be present in the recesses. A roentgenogram of the antrums in a young child may be opaque because of the cancellous nature of the bone.

A purulent discharge in a young infant may not be from the maxillary sinuses, but it may be the result of an infection of the posterior portion of the floor of the nose, which in a young child is divided up into numerous folds, in other words, a posterior rhinitis.

Repeated antrum lavages should not be made if a fibrinous deposit is present in the nose after lavage, and if there is a rise of temperature on the evening of the day the irrigation of the antrum takes place.

DR. G. L. RICHARDS, Fall River, Mass.: I think the keynote of Dr. Emerson's paper is in his statement that after these operations, he gets at times, acute exacerbation. I do not believe that cure is permanent in any of the antrum cases. Unless the opening is permanent (and even if it is), there are likely to be exacerbation and troubles.

DR. HARRIS P. MOSHER, Boston: The most important part of this paper is the statement that in the atrophy which follows a previous infection of the mucous membrane of the antrum there lies a possibility of continued infection. When a mucous membrane has reached the atrophic stage, I have always felt that it was becoming innocuous. Dr. Emerson's point that there is still possibility — even increased possibility — of infection, is a new idea to me.

For some time I have followed these cases by discussing them with Dr. Emerson. At first, I felt that in many cases operation was performed unnecessarily. I have heard from other sources that he has been getting increasingly good results, especially in cases in which there were few or no roentgen-ray and clinical observations. One can, by examinations, arrive at a certain valuation of the gross amount of infection in a given antrum, but one cannot evaluate the ability of any given mucous membrane to produce toxins.

Pus and polypi in an antrum are often self limited. They look big but may cause little trouble. Toxins are not showy. Not their amount but there virulence determines whether their effect is local or systemic.

It is new to me that Dr. Emerson finds the infection in these atrophic cases located in the periosteum rather than in the mucous membrane. I had always considered the periosteum on the antrum a rather innocent structure in continued infections.

DR. FRANCIS P. EMERSON, Boston: I brought these cases forward hoping to learn more from the discussion than from anything I have offered you, but primarily, to bring out the point that I do not operate in these cases purely because of the involvement of the antrum and purely with the question before me of whether I am going to get results. I operate because the patients give a history which to me means that they have a constantly progressive condition that is making invalids of them. The next question is how radical the operation shall be. In these cases I firmly believe from my observation of this type of case (and it covers some seven or eight years) that the entire membrane must be removed, and this bears on the question of the subsequent result. I have compared those cases which my associate (Dr. L. A. Schall) and I have watched at the office and hospital, and when the lining membrane has not been removed, suppuration is present for a long time. Repeated reinfection and unsatisfactory results occur. In those cases in which

the lining membrane has been entirely removed, the cavity gets smaller, and while it is true that these cases have to be watched during the first year, I tell all of my patients that they must not try to place any value on the operation until they have gone through one or two summers of living outdoors. During the first winter there will be reinfection at intervals, but after the first year it is unusual for the antrum to cause any trouble. In regard to the opening that Dr. Richards refers to, I did not discuss the technic of the operation, but in all these radical operations on the antrum I follow the antronasal wall down (including the bony ridge) back to the posterior wall, making a large and permanent opening.

In regard to the periosteum referred to by Dr. Mosher, I mentioned the relation of the periosteum more to bring out the point that cases of deep infection, even though pus is not present, are dangerous and associated with serious systemic troubles.

Disturbances of the Optic Nerve Caused by Malignant Disease of the Sphenoid, with Report of Two Cases. Presented by Dr. Leon E. White, Boston.

This article was published in the Archives, October, 1927.

Spontaneous Hemorrhage from Tonsil; Case Report. Presented by Dr. Virginius Dabney, Washington, D. C.

An intermittent flow from a deep crypt was later found to communicate with a plexus of vessels on the anterior face of the posterior pillar. This flow burrowed externally into the superficial cervical spaces and showed as a large, "doughy" swelling on the side of the neck, from which dark blood could be expressed through the tonsil crypt into the open cavity of mouth. Tonsillectomy was performed without any unusual symptoms appearing later.

DISCUSSION

Dr. John F. Barnhill, Indianapolis: I would like to ask whether Dr. Dabney suspected that a tonsillitis might have been discharged just before the hemorrhage occurred and that the hemorrhage was, therefore, traumatic?

Dr. Samuel Iglauer, Cincinnati: A long time ago, a physician came to me who had spontaneous hemorrhage from the tonsil. This physician had a lesion of the heart, and the hemorrhage was attributed to a backflow or interference with circulation. There was a small bleeding point, as I recall it, in the tonsil, probably a vein, and when this was cauterized, the hemorrhage was controlled.

Dr. Virginius Dabney, Washington, D. C.: So far as I know, there was not a lesion of the heart in this case.

Presentation of Instruments.

Dr. Norval H. Pierce of Chicago presented an antral trochar through which a flexible silk tube could be introduced for the purpose of collecting exudates. This also may be used for the injection of iodized oil 40 per cent.

Dr. Burt R. Shurley of Detroit presented specimens of white rats and chickens showing suppurative processes due to vitamin deficiencies.

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